

ille, F
ith Valley Itinerary

(4)

1891

1st draft? Holt & Farnsworth

This was published
in condensed form
(see letter inside)
Also see found journal

1891

more complete

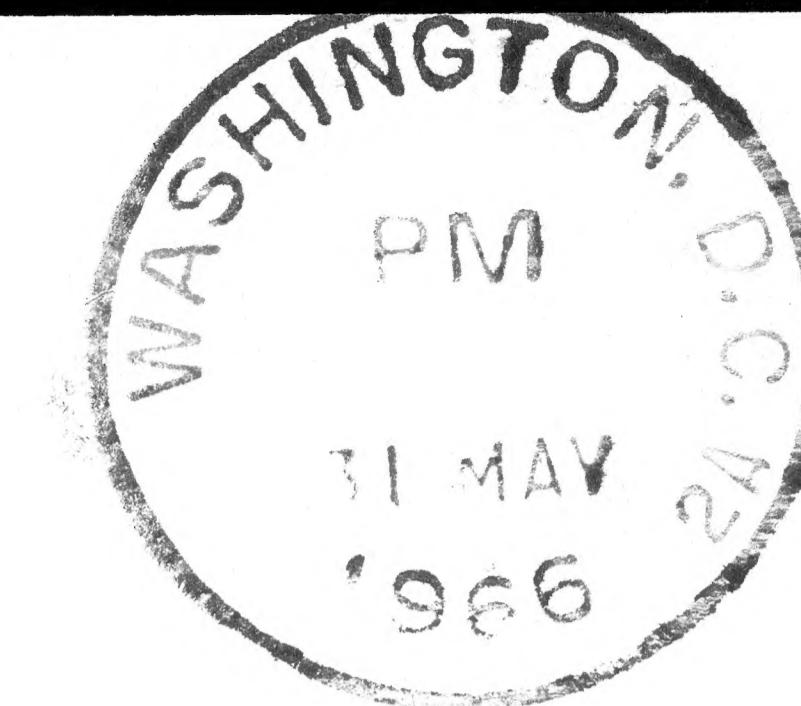
letter

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Coville, F. V., & Applegate, E. I.

Catalogue. Cascade Mts., Oregon. 1898.

Plants Collected
in
the Cascade Mountains of Oregon
by
Frederick Coville and Oliver S. Atkleson
in the years
1897, 1898.

Coville, F. V., & Applegate.

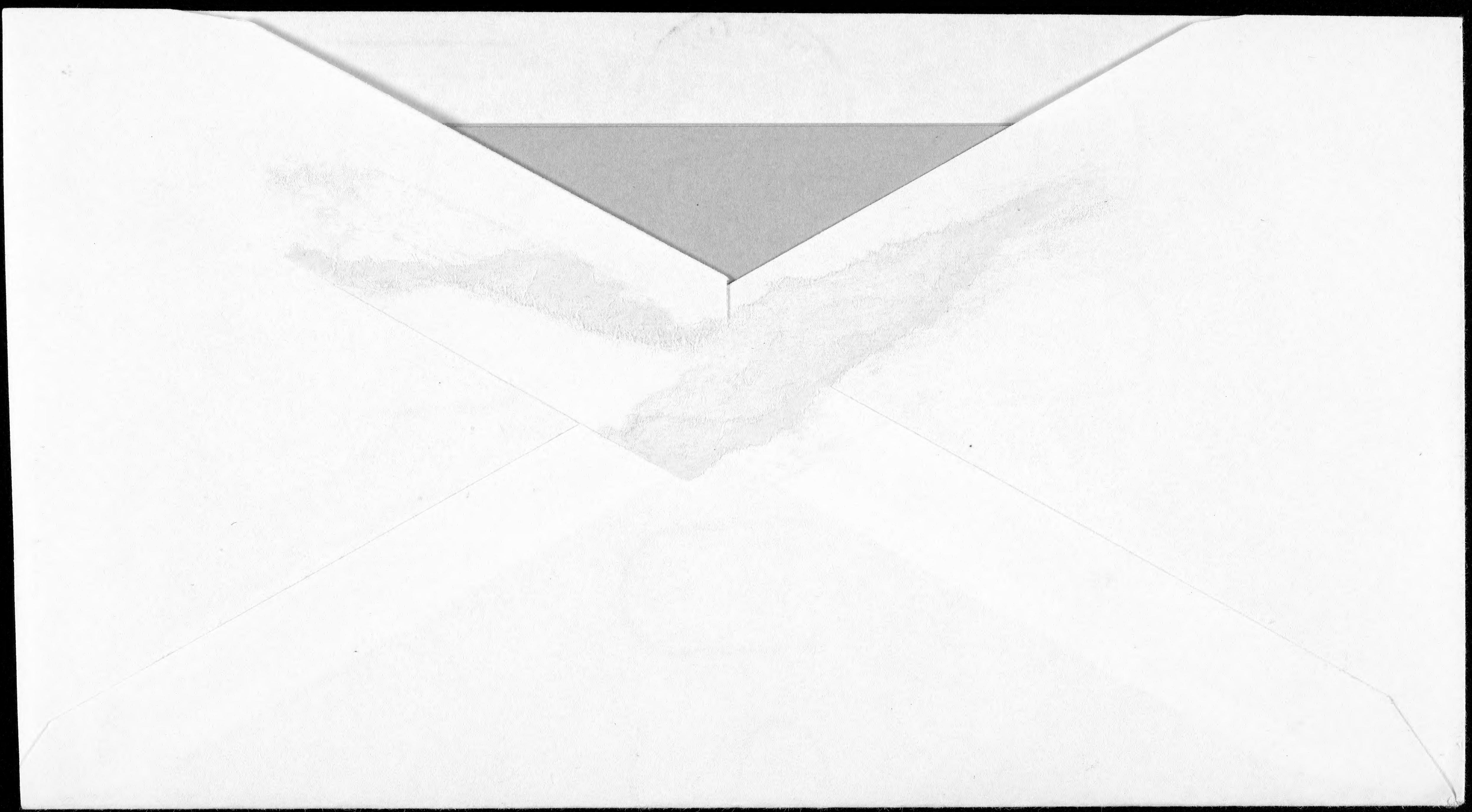
Catalogue. Oregon. 1897. I.

v.1

Coville, F. V., & Applegate.

Catalogue. Oregon. 1897. II.

v.2



UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
WASHINGTON

~~DIVISION OF BOTANY~~

Plant Exploration and Introduction

September 26, 1934

Dr. Wm. R. Maxon,
Smithsonian Institution.

W. R. M. SEP 27 1934

Dear Dr. Maxon:

With this letter I am sending you the manuscript of my itinerary on the Death Valley Expedition. When the Botany of the Death Valley Expedition was printed, in 1893, the itinerary as first written had been much reduced under instructions from Dr. George Vasey, then Botanist of the Department. I suggest, therefore, that this manuscript be kept, as being more detailed than the published itinerary and therefore of possible use to other botanists working hereafter in the Death Valley region.

Very truly yours,

Frederick V. Coville

Frederick V. Coville
Botanist

FVC-G

Inclosure

[Death Valley Expedition] *by*
Journal
Itinerary

F. V. Coville

In compliance with the instructions of my commission I proceeded from Washington to San Bernardino, California, reaching there Dec. 24, 1890, by way of the Atlantic and Pacific Railway route. On the 26th second day afterward Mr. T. S. Palmer, acting chief of the expedition, arrived at San Bernardino, and reported to him as directed by ~~the~~ ^{who was commissioned as my assistant on} ~~the~~ ^{the expedition reported for duty} ~~Mr. Frederick Funnston of Carlyle, Kan.~~ ^{A few days after my arrival at San Bern} ~~ardino~~ ^{ardino} at San Bernardino Dec. 26, 1890.

On the first day of January, 1891, our outfit having been nearly completed, Dr. A. K. Fisher and Mr. Funnston set out ~~in advance~~ on horseback, in advance, for the Mojave Desert, ~~by way of~~ following the road through the Cajon Pass of the San Bernardino Mountains.

afternoon of the

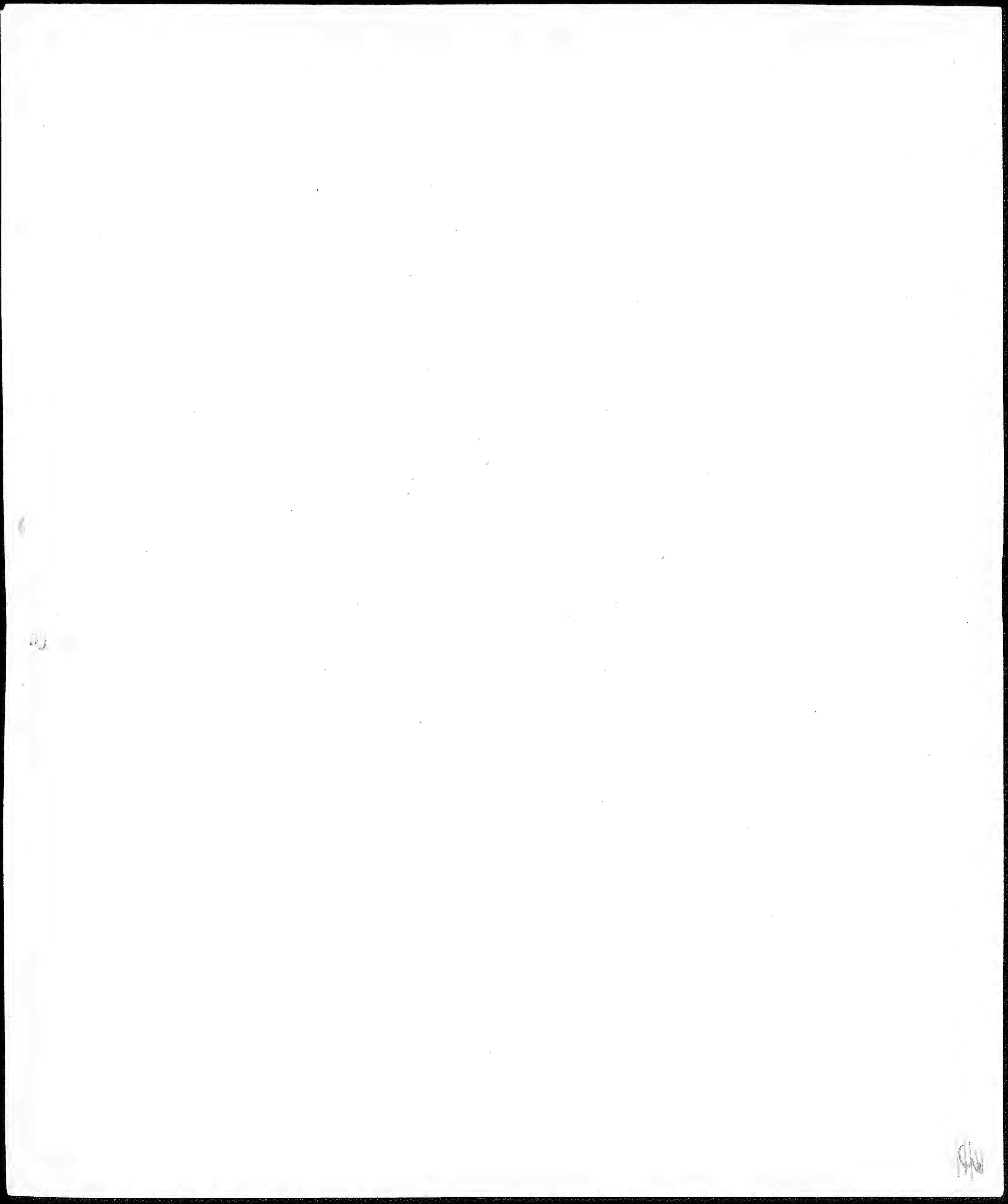
On the ² third of January, 1891, I left San Bernardino
by the same route, Mr. Palmer having purchased
the necessary portion of ~~his~~ ^{the general outfit} supplies there, and
having arranged to complete the supplies at Dag-
gett, a station in the Mojave Desert on the Atlantic
and Pacific Railway. The outfit consisted of a heavy
wagon drawn by four horses driven, ~~by~~ ^{as} a team-
ster, ~~with~~ two saddle horses led behind, and myself
on horseback. It was ~~not~~ ^{quite dark when} ~~until darkness~~ we
reached Martin's ranch, about 14 miles westward
from our starting-point. As the road from San Ber-
nardino to Daggett passed several ranches, we had
not provided ourselves with the ^{cooking} apparatus necessary
for camping out. We were ~~was~~ ^{disagreeably} surprised,
therefore, when the tenant of the ranch refused ~~to~~ ^{all}
~~to give us anything to eat~~ ^{supper} although I offered him pay for it.
~~as you~~ ^{and} ~~as~~ ^{the} ~~for~~ ^{time} during
this was, with one exception, the only time during
the progress of the expedition when we were ~~in~~ ⁱⁿ
hostitably treated; ~~and~~ indeed in most ~~hostile~~ ^{places} we
were received with hearty cordiality.

On the following morning, Sunday, Jan. 4th we proceeded
up the valley of the Santa ~~Ana~~ ^{Ana} toward Cajon Pass. Before
we had gone many miles the very unpleasant dis-
covery was made that one of our team horses was
an inveterate barker. The teamster succeeded, however,
with my occasional assistance, in bringing his load

over the hill and a few miles past Cajon station ~~with~~ ^{on} the ~~high~~ ^{high} south and sandy road to the point at which the road leaves the valley bottom, the Brute Una, and ascends the steep southern slope of the San Bernardino mountains into Cajon Pass. The team was stopped here and I rode a few miles up the slope to Crowder's ranch. ~~hasten~~ ^{an} additional ~~set~~ ^{set} of horses was procured ~~by~~ with the assistance of which the wagon and its heavy load were drawn to Crowder's. ~~I~~ ^I ~~agreed~~ ^{agreed} taking an extra lead and horse went back to Cajon station, and then met Mr. Palmer who had ~~the horses~~ ^{the horses} come up from San Bernardino by rail. We came up that night at Crowder's ranch, about three miles below ~~the~~ ^{the} summit of the pass.

Jan. 5, 1901. We left Crowder's and with the assistance of the extra team reached the summit without difficulty. Here, at an altitude of ~~feet~~ ^{and} below the beginning of timber on the mountains, the characteristic flora of the San Bernardino ~~upland~~ ^{valley} gives way to the equally characteristic weird flora of the Mojave Desert. The ~~desert~~ ^{desert} ~~in~~ ⁱⁿ ~~canal~~ ~~spah-a-til~~ ^{spah-a-til} or dense shrub thickets of the south slope are replaced within a mile by the open ^{filatian} ~~filatian~~ ^{grass} ~~grass~~ ^{part} of the ~~desert~~. From the summit ~~the~~ ^{the} surface of the desert descends ^{and} and eastward the surface of the desert descends with a gentle dip toward the valley of the Mojave River.

The teamster ^{with the wagon} continued on the dirt road toVictor station, the ~~station~~ ^{Ranch} on the Mojave River, the Mr. Palmer and I turned off eastward ^{uphill} ~~uphill~~ ^{uphill} to ~~top~~ ^{top} ~~past~~ ^{past} the first station



See Franklin

no 30

Franklin

See

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north of Cajon Pass California
the first station on the ~~southern~~ ^{Central} ~~Central~~ railway

over Cajon Pass. Our route lay through
Yucca whipplei. (Juniperus californica)
yuccas, and junipers, which were
not over this abra clearly
at this point.

arranged in
yuccas. At about eleven o'clock we
reached Hesperia and found Dr. Fisher
and Mr. Fawcett awaiting us.
They after leaving San Bernardino on
January first, had stopped ~~to the first~~
about two miles below Cajon station,
nights at Lawrence's ranch, and on the fol-
lowing day reached Hesperia, in the
vicinity of which they had since
been collecting ~~isolated~~. After dinner we four ~~went on~~
to Victor. At Hesperia the yucca
cease and are replaced by creosote-
bush (Larrea tridentata). The yuccas
~~however~~ continued sparingly almost
down to the Mojave River at Victor;
yet here were but short, and
the lack of junipers made the
desert open and monotonous.
We crossed it in two hours.

It was our first night in the desert, 5.
~~too~~, on the morning
and the fact that found upon our
bed-clothes and the coyotes
(ki-yó' tay) that looked about the
camp gave us a hint of our coming
~~experience~~
~~not of not.~~

Jan. 6, 1891. In the morning we
~~faded the shallow river~~
~~crossed the river~~ and followed the road over the ~~desert~~
desert in the direction of Daggett.
We passed over a summit to
the westward of a marble quarry
in an adjacent mountain, through
an oblong valley a few miles
in length, then over another
low divide and just ~~before~~ at nightfall
broke reached Stoddard Wells. The
water of a spring in the barren
mountain ~~slope~~ side had been con-
ducted to the roadside in an iron
~~pipe~~ and there accumulated
in an immense iron-bound
wooden tub or tank. It could
be let out through a hole

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near the bottom ~~just~~⁶ to a bank-
ing trough for ~~horses~~^{stock} and other
stock. This was the only source
of water between Victor and Daggett
a distance of about forty miles. Of
the house that once stood near,
only the broken-down stone wall
remained, and in the lee of its
chimney we ~~placed~~^{threw down} our table-
cloths, set the lantern in the
chimney-hole and shivering
at our cold supper. The wind
was cold and piercing, the sky
dark—a typical winter night in
the desert. We spread our beds on
the dry fine gravel among the
creosote-bushes and, ^{chilled and} without a
fire crawled into our blankets.

During the day we had made
our first close acquaintance with
the mountains of the desert, in
this ^{perhaps better} region ~~too~~ called ~~for~~^{for} ~~hills~~
~~rocky~~ hills ~~for they were~~ only a few low

and feet in height, ^{rocky} treeless, with only scattered creosote-bushes visible from the plain below, and even these wanting on steep slopes. The whole view was that of a mass of bare rock, and an impression constantly forced itself upon a stranger to these regions that the mountains had never ~~in any season~~ been moistened with ~~rainwater~~ ^{mineral water}.

Jan. 7, 1891. We ~~had~~ continued along the road through a country very similar to that seen on the preceding day, and late in the afternoon reached Daggett. This is a ^{settlement} ~~town~~ of probably thirty buildings, which serves as a railroad connection for silver and borax ^{mines in the} ~~mining establish~~ adjacent mountains.

~~Jan. 5, 1891.~~

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~~the~~

just before it evening I went with Dr. Fisher out into the desert northward from the town toward the dry bed of the Mojave, ~~while he~~
~~at traps for ^{insects} ~~tharact~~~~
~~in~~

Jan. 5, 1891.

Dr. Fisher and I started in the morning, ~~it~~ ~~was~~ ~~in~~ ~~the~~
our route of the preceding evening. ~~to the~~

~~bed of the Mojave, ^{the} crossed it and~~
~~turned northward toward the~~
~~stumps - will about a mile~~
~~north of the river~~

The bed of the river here ~~was~~ ~~dry~~, ~~and~~
was composed of loose dry sand, ~~and~~ ~~the~~ charac-
teristic vegetation ~~was~~ composed principally of
twisted ~~shrub~~ ^a ~~shrub~~, the desert willow
(*Chilopsis saligna*) and two ~~species~~
of ^a *Baccharis* and *Lepidosper-*
ma squamatum. Behind and in
the drifts of these bushes the
sand drifts heavily from the west,
thus building up high banks

and re-positioning and altering the
channel of the stream. ~~or fear~~

~~water~~ Jan. 9, 1891. In the morning I waded the river northeastward from Daggett and then turning northeastward walked about ~~about~~ a mile across the desert, and ascended a small flat-topped butte north of the stamp-mill. From this elevation of a few hundred feet the bed of the Colorado River could be seen stretching eastward and westward, and in the latter direction large pools of water were visible in it at frequent intervals.

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white
tomato - be of [#], desert cassia" and two
[#] Capparis Andersonii [#] Cassia arvensis
cactuses [#] O. elatior are frequently occur.
[#] O. elatior and O. texensis

Jan. 10, 1891, having completed our outfit and stock of provisions ~~and~~ ^{and} outfit we left in the morning Daggett, at about 9 o'clock, crossing the Mojave River and travelling toward Death Valley northward on the road ~~to Death Valley~~ known as the Lone Willow route. The company consisted of Mr. Palmer, Dr. Fisher, Mr. Huston and myself, on horseback, on a four-horse team with a ~~teamster, George Porter~~ ^{P. T.} driver, and a two-horse team and driver hired temporarily, ~~and~~ with their drivers, and a cook ~~Michael Barnes the cook~~. My personal outfit was made up according to the needs of the expedition. I wore ~~clothing~~ ^{of the ordinary kind} ~~for~~ ^{for} the weather was often cold - over my coat a canvas hunting-coat, and often in addition an overcoat. My

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shoes were of the ~~kind~~ commonly used, but later in the season, when there was mountain climbing to be done, it was found necessary to substitute ~~the~~ ^{thick-bottomed} ~~thick-soled~~ heavy ^{thick-soled} ~~cowhides~~ miners' shoes, their soles ~~the~~ and heels thickly set with ~~steel~~ hot-nails. As for hats, ~~the~~ a wide-brimmed felt or sombrero is most serviceable in winter, while for summer use a cork helmet or one of the manufactured equivalents which will shade cooler and pleasanter. the eyes is ~~brighter and cooler~~ For firearm I carried ^{a forty-four} ~~a~~ Colt's ~~#~~ magazine [#] carbine, yet for general camp use, in these regions at least, a breech-loading shot gun ^{An amera was used for rapping differences} is better. The apparatus for collecting and ~~preserving~~ ^{fixing} plants consisted of a knife, a fish, a portfolio, and two board

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passes. The knife was of the kind
used by cotton inspectors in
the states ~~in~~ ^{to} open the
~~sacking that~~ ^{the} ~~sacking~~ ^{is} covers of the cotton bales.

A description of it is given in
the ~~vol. 1~~ ^{vol. 1}, p. ~~1~~ ¹. The ~~which~~ ^{is} The ~~which~~ ^{is} The ~~which~~ ^{is}
was ~~made~~ ^{made} after a pattern in com-
mon use among ^{plant} collectors in
the southwest. Its head ~~was~~ ^{is} of steel,
with a slightly curved blade about
five inches long and at the ex-
tremity ~~one~~ ^{one} inch broad, and a head
about two inches long narrow-
ing to a point. The handle
~~was~~ ^{is} slender, of strong tough wood,
and about three feet long.
For digging plants in hard
clay soil ~~or~~ ^{in gravel, or} among broken stones,
or for uprooting cactuses and
other ~~of~~ ^{of} shrubs this instru-
ment ^{is} by far the best that I have ever used
~~is~~ ^{is} ~~an~~ ^{an} ~~called~~ ^{called} In loam,
mud or sand the knife is

better. The portfolio was made of
bakers' boards covered with canvas
and was usually carried ^{tied to the saddle.}
The presses were ordinary ~~ones~~ made
~~the saddle.~~ of boards, and straps were used
for applying pressure.

My method of keeping field notes
resolved itself, after a few weeks
experimenting, into three heads, a cata-
logue of specimens collected, a journal,
and a slip system of ~~technical~~ ^{special} notes. In the catalogue there were
entered for each specimen, ^{new} ~~and~~ with its dupli-
cates, a number, the date, locality,
station, altitude, and any desirable shot
marks. A specimen with these data
~~especially~~ accurately recorded is, for the use of
~~systematic~~ and geographic botany,
inestimably more valuable than
many specimens whose history ~~can be~~
but vaguely known.

In the journal were recorded
under each date, the location of the

~~following~~ course of the day's
night's camp, the journey, and a few
notes indicative of the general and vegeta-
tive features of the new country seen.
When the camp was stationary for sev-
eral days, the excursions made from
it ~~were~~ recorded that ~~the~~ a botanist
subsequently using the journal on
the same ground may be aided
by it in locating the stations
of particular plants in the collec-
tion. The details of work at camp in
~~preserving~~ and cataloguing specimens,
and in writing notes ^{has been} omitted.

On the slip notes were recorded
~~items of interest~~ facts ^{which} of all kinds ^{that}
had reference to the botany of the ~~the~~
region, ^{but} which were not shown by the
specimens themselves or in the cata-
logue. These were ^{kept in large envelopes filed}, ~~arranged~~ by sub-
jects.

With this outlet for the botani-
cal work of the expedition, we con-
tinued ~~through~~ the Mofave Desert northward

toward Death Valley. The country is tran-
versed by low ranges of mountains,
between two of which lay our road ~~going~~
rising toward the north ~~and~~^{15°}. The vegeta-
tion continued ~~the same~~ as it was
about Daggett, except that a few miles
from the Mojave the joint-pine ceased
and about nine miles from the
day's starting-point the tree-yucca
began again. The desert ~~Acacia~~
~~Acacia~~ and another shrub ~~#~~ occurred frequently
~~#~~ Hymenoclea Salsola

in sandy washes, while ~~the other~~[#] desert
plants ~~#~~ were occasionally seen
Lepidium Fremontii and Salsola repens
and two ~~of~~ of the grasewoods[#]

[#] Atriplex hymenelytra and A. confertifolia
~~seen~~ were often seen in the harder, more al-
kaline clay soil; while higher up the
gray joint-pine[#] and a leafless ~~tree~~^{shrub}

[#] Ephedra nevadensis

shrub[#] of the mint family became abun-
dant.

[#] Salsola repens

The lake was the ~~dry~~ ^{for the water} sink of the ~~entire~~¹⁷ basin, which was situated ~~to~~ ^{the} entire basin, ~~and~~ many miles in extent, and necessarily contained a large quantity of alkaline deposits; yet these did not effloresce

on the surface of the clay. ~~about~~ ^{the} margin of the lake the first

~~No water was anywhere contained in the lake~~

plant was a lichen* which grew on

* [no 170]

the formative ~~broken stones~~ ^{of} the miniature beach. Next came a broad strip of one of the [#] *Acacia constricta* and one by one the desert shrubs followed. The mesquite-bush was the plant that, with the exception of the yucca, held itself most remote from the hard alkaline clay, and showed its lower limit at an ^{abrupt} line visible for miles across the valley-bottom. Throughout ^{the greater part} ~~most~~ of the year these dry lakes retain the characters noted above, but if a heavy rain occurs they ~~are~~ ^{become} covered with water ^{to a} shallow depth, and this percolates

into the clay and softens it
~~through~~ ^{soaks} ~~the~~ ^{the} clay so that it
is the traveling road is impassable for wagons.
that sometimes

In drying again after such a
wet period, the clay does not crack.

From the bottom of Paradise Valley
we continued northward again, rising
toward the ~~next~~ ^{second} divide, and at night
made a second dry camp
~~camped~~ [^] about two miles south of
Copper City Spring, the site of a ^{small} deserted
mining settlement.

When camping ~~one accustomed to camp life in~~
[^]
a region where trees grass and
water abound, one never ~~experi-~~
~~ences~~ [^] the disagreeable experiences
necessary to a dry camp in the
desert. For the last two days we
had ^{had} no water to use except ^{that}
which was ~~#~~ brought with us,
in ^{our two} barrels and ⁱⁿ canteens, from
Daggett. ^{The finished water} ~~Distributed among the horses~~
~~camp~~ [^] It was required ~~#~~ ^{drink} we
principally to drink, both for our-
selves and for the animals; as

that little could be ~~had~~ for 19
the other uses of the camp. ~~too~~ ~~for~~
~~Hunting~~ ~~making~~ ~~canoe~~ ~~face~~

a dry camp ^{afterward} became however, a fre-
quent necessity with us.

Jan. 12, 1891. We continued ~~along~~
~~the~~ ascending the divide and soon
reached Copper City Spring. ^{Mr. Palmer} had
ridden on in advance of the
party, and I ~~had~~ ^{could} improved the
opportunity of ascending the adja-
cent rocky hills and exam-
ining ^{its} vegetation. I saw here
for the first time ~~at~~ ^{one} ~~Rosapff~~
merias # ^{while} another shrub, which
~~#~~ K. canescens? ^{##} Coleogyne ramosissima

had been seen before only on the
high ground ~~divide~~ between Victor and Waggett,
was abundant.

We crossed the divide above
Copper City Spring, ~~and~~ descended
its north slope, passing ^{on the way} a de-
serted ranch house, and at a-
bout the middle of the afternoon

at the western base of Pilot Knob
reached Granite Spring. Owing to ~~the~~
several delays we had made
only a very short day's journey.
~~At~~ ~~the~~ From this point ^{one of} our ~~team~~
which had been hired only temporarily
~~team~~, returned to Daggett ~~with~~
~~his team~~

Jan. 13, 1891. We left Granite
Spring and continued ^{around the northwest base} ~~of the mountain~~
into the valley lying to the north, leaving above
~~past~~ ~~out of~~ ~~valley~~ ~~as the~~ ~~the~~ gla-
ciers with the other plants that
accompany them. ~~clashed on the~~ ^{western}
~~of Pilot Knob.~~ The road then turned
eastward for several miles, and again
northward, passing over a peculiar
line of low, strongly alkaline,
gravel-covered clay hills into
the south end of Paramount Val-
ley, and followed along the dry bed of a
~~After travelling northward ~~several~~~~
~~small stream which~~ ~~to~~ the course of
~~into~~
which was northward. Late in
the afternoon we reached Lone Willow
Tanks, about twenty-five miles from

Granite Spring. There we found Mr. Bailey and Mr. Nelson, ^{and Mr. Newman} encamped with their cook and packer.

Jan. 14, 1891. I made a short trip with Mr. Bailey ^{in the morning} to the mouth of a small ravine ^{about} ~~to~~ one-half mile west of the tanks. The valley bottom ^{opposite} Lone Willow Spring is characterized by a growth of creosote-bush and white sage [#] with a few cactuses [#] ~~#~~ ^{##} *Echinocactus polycephalus*, *Franseria humosa* ^{and} *Opuntia echinocarpa*, *O. basilaris*.

While near the mouth of the ravine occurred a few other characteristic plants. In the ^{area of} ~~area of~~ [#] *Eucnide urans*, *Lycium Andersonii*, *Dalea Fremontii*

afternoon I went westward about a mile up the mountain slope to the ^{about 1000 ft. above camp,} ~~signal~~ Lone Willow Spring upper spring, collected a few plants on the rocky slopes near by, then and followed a ditch over the low ridge back to the original Lone Willow Spring. A single willow tree, evidently ⁺ *Glauca* makes the place and has given *x. Salix laevigata*.

rise to the name. The water of the upper spring, several years before our visit, had been conducted in iron pipe to the lower spring and thence down the ~~valley~~ slope to the ~~eastern~~ side some ^{large} iron tanks ^{by} the roadside. The pipes are now broken and the tanks empty, so that we were obliged to haul out water from the upper spring.

Jan. ¹⁵ 1891. I remained in camp.

~~Early~~ Jan. 16, 1891. I rode with Mr. Bailey ~~eastward~~ ~~northward~~ across the valley to the foot of Brown's Peak, about six miles from camp ~~at~~ ^{at an altitude of} and at an altitude ~~feet~~ ^{ft} above it. ~~about 800 ft higher~~. Here we tied our horses and began the ascent of the southwest slope of the ~~mountain~~ ~~on~~ ⁱⁿ ~~on~~ ~~ft~~. The mountain-side here was steep and in many places covered with "slide-rock". This is the name ^{applied in many mountain regions} given to a bed of broken rocks or stones situated on a slope so steep ~~possibly~~ ~~that they slide down~~

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from a slight disturbance. The ^{commonly} ~~beds~~ ¹ have a surface slope ~~is~~ ^{commonly} of 30° to 35°, are devoid of vegetation, and are frequently situated ^{such} on very precipitous mountainsides ~~so~~ that they constitute the only ^{though always ~~too~~ some} practicable route for climbing.

~~at 6000 ft above camp we saw~~
~~Cooper's with the hand east~~
~~the first yuccas~~

The mountain vegetation varied considerably from that of the valley in the addition of several new shrubs. At 2800 ft above camp we came upon the first yuccas, and 450 ft higher we found a beautiful shrubby lupine[#] in flower. The summit ^{feet} ~~#~~ Lupinus rotundifolius Th. Aug. 18 1877 of the mountain was, ^{by the aperio} ~~by the aperio~~ ^{it} ~~for~~ scattered 3560 ft above camp, the summit ^{which we had seen on the preceding} ~~summit~~ ^{from the tanks} yuccas, ~~more~~ ^{more} ~~than~~ ^{than} day with a glass. The scant ^{shrubby} vegetation ~~of shrubs~~ is similar in

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aspect and character to that of the desert below, but made up principally of different plants*.

* Eurotia lanata, Lycium cooperi ~~and~~ ^{cooperi}, Malvastrum (?) Eriogonum (?)

Thamnosma montana, Gragia polygaloides, Hymenoclea Salsola, and Opuntia basilaris my. Hickey by a more circuitous route ^{had reached the same point for topo-} ^{graphic work. We filed up at the highest} ^{point a small monument of stones and placed on it} ^{a record of our names, our occupation, and the date.} ^{From the summit}

the north slope of the mountain about 600 feet, then turning westward joined Mr. Bailey again and came down the mountain opening a little watershed through a cañon, ~~not~~ far from the point at which we began the ascent. In this cañon, on the south face of the mountain, the shrubs are bent up the slope, and indicate a strong prevailing south wind, while in another cañon on the north slope of the mountain, the shrubs are bent quite as strongly downward, in a northerly direction.

From the base of the mountain we returned to camp following our ~~by a~~ back trail backward across the valley.

Jan. 17. Mr. Funston and I set out on ~~horseback~~ for Lone Willow Peak, a high point about eight miles southwest from Lone Willow Spring in the Slate Range. We followed an old wagon-road up the steep mesa westward from Lone Willow tanks passing to the right of both the ~~upper~~ lower and upper springs and entering the mouth of a cañon about a mile above. ^{We followed} ~~and~~ ~~went~~ this cañon southwestward ~~from the upper~~ as far up into the mountains as the horses could be ridden, staked them out to feed upon a bunch grass [#] ~~that~~ that grew there. This grass ^{is of frequent occurrence.} ~~frequently occurs in~~

* *Stipa viridula* [S. speciosa FC. Aug. 16, 1934]
 the mountains throughout the day,
 and may be expected, ~~at~~ ^{on the rocky} slopes
 of mountains and in cañons, at an

altitude of 2000 feet, ~~and grows~~ from this height ~~up~~ well up into the ~~forest~~ ^{guacas.}
It is a perennial and grows in tufts scattered so widely over the ground that ^{a horse} ~~must~~ ^{if left to} be hobbled instead of staked when left ~~to~~ ^{upon it for more than a} to feed upon it. Although having ~~leaves, roots, and~~ but few green leaves at this time, ~~it bears~~ ^{season}, the dried leaves and stems of the preceding ~~year~~ ^{season} growth, ~~and~~
~~the~~ The horses were very fond of it, and it ~~appeared~~ ^{really} to furnished them considerable nourishment, apart from the grain they ate. During the four days ~~that was~~ ^{offered to them} and three nights between Daggett and Lone Willow tanks, ~~no~~ grass was found for the horses, and they ~~were~~ ^{had been} fed only with the hay and grain that we had brought with us.

Having tied our horses, we continued up the canon on foot nearly to its source and then as-

cending a steep ridge to the right we were upon the shoulder of the mountain. I went about three miles farther upon the broken ^{to an altitude of} ~~to an altitude of~~ ~~feet~~ but ascending slope ~~until~~ ^{until} ~~had~~ ^{had} a scattered growth ~~ascertained~~ ^{ascertained} the ~~absence~~ ^{absence} of yuccas was found, ~~still~~ but the summit of the ^{still} ~~still~~ appeared to be a few hundred feet ~~peak~~ ^{peak} ~~was~~ ^{was} still ~~nowhere~~ ^{nowhere} higher. The vegetation throughout ~~was~~ ^{was} very similar to ~~and~~ ^{and} that on Browns Peak, ~~the same~~ ^{the same} ~~gradual~~ ^{gradual} and presented the same successive changes at different altitudes.

We returned to camp by the same route. At ^{one point in} the cañon, a few miles from its mouth, there is a growth of cane* and other plants ^{*Phragmites vulgaris*} ~~*cooperi*~~ indicative of a constant supply of water in the soil. ~~At~~ ^{By digging} ~~at~~ ^{at} ~~the~~ ^{the}

a spring could undoubtedly be found by digging.

Jan. 18, ~~Sunday~~ ^{in the afternoon} I made a trip on horse-back about half way ~~up~~ to the summit of Lone Willow Peak, by ~~it~~ nearly the same route followed on the preceding day but climbing the mountain proper along the hog-back west of the canon described.

Jan. 19. We broke camp at Lone Willow tanks and ~~traveled~~ set out ~~continued~~ ^{for} ~~and north~~ Death Valley by the old borax road. It ~~leads~~ ^{extends} northward ~~for~~ ^{for} miles coinciding with the Panamint road for a few miles, then turns eastward across the valley-bottom, and ascending a ^{broad} ~~low~~ ^{called Windy Gap} divide, ^{and} north of Brown's Peak, ~~called~~ ^{spilling off} gradually northeastward toward Death Valley.

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a few miles ~~southward~~ below the segment of this
~~after several hours~~ divide, the valley narrows and the
road descends into a ~~narrow~~
rock-walled canon. We kept on
down this canon by moonlight un-
til ~~nearly~~ 10 o'clock at night, when we
~~were~~ made a dry camp ~~on~~
upon the sand and gravel.

During the day we had been re-
minded of the country that lay
before us by passing a roadside
grave with the inscription on the
headboard, in pencil, "James Cole-
man. Buried by Gomer Jones
June 16 1879", and another board,
at the fork ~~of~~ ~~near~~ an old min-
ing road, bearing the legend "Tay-
lors Mine 16 miles to Hell".

The excessive dryness of the re-
gion was evidenced by the fact that
the pencil-marks on the grave-
board, which had been twelve years
exposed to atmospheric effects,

we still appeared clear and fresh, and the surface of the ~~wood~~ ~~stuff~~ had retained its natural appearance and not changed to the gray color of ~~a~~ weathered timber.

7 In Windy Gap the bushes indicate a strong prevailing southwest wind.

Jan. 20. In the morning we continued down the canon and soon emerged into ~~the south end of~~ Death Valley near the south end of its alkali flat sink. On either side were high mountains and between them the narrow valley not more than ten miles wide from mountain to mountain. In the ~~sug~~ bottom of the valley was the snow-white stretch of salt and alkali, and to the northward, perhaps fifty miles ^{away}, mountains valley and salt-flat vanished in the haze.

A few miles from the mouth of the canon we passed the



an old watering place called
Salt Wells. a hole about ^{twenty-five} ~~sixty~~ feet deep had been dug in former
years, and ^{from the} ~~at the~~ bottom, ^{we} ~~was~~ drew up some water which was
found to be a nearly saturated
brine.

From Salt Wells we continued
~~northward~~ ^{side} along the west ~~side~~ ^{note}
of the sink. Crocote-bush ~~had~~ ^{had}
been characteristic of all our route
until we neared the salt-marsh,
and but here, under the influence of
clay and alkali, it gave way
to a greenwood[#], that in turn to
Atiphy polycarpa

salt-grass ## and finally to # pickle-weed. ####

Distichlis spicata ^{After} # Stachys occidentalis

Beyond this there was no vegeta-
tion whatever. The road however
~~did not~~ ^{continued} pass outside the limit of veg-
etation.

Alstroemeria

at about the middle of the afternoon
~~At about ten miles from town we~~
~~Toward evening we approached~~
came within sight of ~~the~~ a large clump of mesquit ~~the~~ bushes
~~# Prosobis juliflora~~ and a little further on we came
upon another clump where we
made a dry camp. Just before
dark I walked out on the salt
marsh. Near the margin the soil
had the appearance of ~~a~~ ^{an area of} ~~soil~~
~~covered with cow tracks half~~ ~~obliterated and~~
~~soil with half~~ ~~and~~ with a little fine snow in the
hollows. Farther out the soil is
moist smooth and covered by a
film ~~of~~ ^{of} incrustation. At a distance
of about a half-mile from the
line of vegetation, I came upon
a small stream of water, clear
but almost saturated with salt.

The pickle-weed at this part of
the valley grew in bunches about ^{which} 1
the soil accumulated so as to
form hummocks often three
feet in height and several

feet across. In the mesquite clumps, which were in less alkaline situations, ^{situations} as similar ~~the same~~ banking of the soil had occurred. Dry sand blowing along over the ground had drifted ~~into~~ under the bushes and finally formed mounds often ten to fifteen feet high, out of which the ^{smaller} branches of the mesquites projected like briars.

Jan. 21. After a few miles travel on the following morning, we came upon a shallow ^{shallow} well containing ^{containing} colored water of disagreeable taste, ~~it~~ ^{and} known as Mesquit Well. The mesquit clumps became now almost continuous. Early in the afternoon we reached Bennett Wells and went into camp with Mr. Bailey and Mr. Nelson who had gone out ^{and} ~~and~~ main party. ^{had} walked out about a ^{quarter} mile to the edge of the salt marsh, which is here very ^{hard} and rough.

Jan. 22, ~~22~~

I made a ^{short} trip westward from

We camp to the ~~foot of the~~ gravelly mesa
that slopes ^{gently} down from the foot of the
Panamint, and returned to camp by
a detour ^{northward} ~~northward~~ about through the
mesquites.

Jan. 23 Mr. Bailey and I started
on foot across the salt-marsh
in a direction a little south of east
from Bennett Wells, toward the
mouth of a cañon in the
Funeral Mountains. We counted
our steps across the marsh and
found the distance to be about
five miles. Three or four
stream-beds trending northward
were crossed, but only one contained
water, ~~stagnant~~^{located}, in isolated pools, and
saturated with salt. ~~On the marsh~~^{near these}
pools grew a few ~~specimens of~~[#]
fiddle-pickle-weed and
#Suaeda suffruticosa,
but otherwise no ~~plant whatever~~
~~#~~

was seen upon the march. 35-

At the mouth of the canon toward which we had made our objective point is a gravel slope about a mile long bearing no shrub ~~but~~ ^{except} one of the graserwoods. ^{*}

~~Atop the hill~~ ^{by} ~~the~~ ^{the} ~~canon~~ ^{two or three miles} ~~from~~ ^{from} its mouth, ~~The first canon~~ was obstructed by a perpendicular wall of rock and we were obliged to ~~turn~~ ^{two or three miles} follow southward along the base of the mountain until we came to ^{a pair} ~~two~~ of canons ~~opening~~ ^{spreading from} ~~the~~ ^{the} ~~close~~ ^{close} together. We ascended the northernmost of these till we were again ~~crossed~~ ^{stopped} and then crossed a low ridge into the other.

Proceeding a few miles up ~~this canon~~, we camped for the night.

~~Pass~~ The mountain was rugged and the vegetation although similar to that of the ranges ~~that~~ ^{which} we had seen before was much scantier.

Jan. 24. We retraced our route of the previous day to Bennett Wells.

Toward evening I rode ~~but~~ three miles north from Bennett Wells to the site of the ~~old abandoned~~ ^{now defunct} Eagle Borax Works. Here I saw for the first time a few trees of the screw bean*.

*Prosopis pubescens

At Bennett Wells there is a shallow well of excellent water, and plenty of mesquit and ~~two other~~ for fuel, and while fairly good grass for the horses, ^{is offered by a} ~~is offered by a~~ bunch grass^{#2} ~~the grasses~~ which is a-

#²Sporobolus airoides

abundant through the mesquites.

Jan. 25, 1889 rode to the Eagle Borax Works again and spent a few hours investigating the alkaline swamp there. No large mesquites, ~~except~~ ^{only} one at the spring, were to be seen, although seedlings of a few years growth were abundant. The older ones had evi-

dently been cut for firewood.

The ~~principal~~ ^{principal} vegetation of the swamp, which covered several ~~acres~~ ^{acres}, is made up principally of the bunch grass common at Bennett Wells, salt ^{cane^{#2}, yerba mansa^{#3}} grass^{#1}, two rushes^{#4} and a few ^{#5} sedges.

Dicichlis ^{spicata} ~~maestra~~ #² Phragmites communis

#³ Arenopsis californica ~~gigantea~~ #⁴ Juncus balticus and mesicanus and

L. Caperis #⁵ Eleocharis rostellata, Scirpus la-
occidentalis

cicutaria and S. maritima [S. paludosus] Aug. 18

Jan. 26. I set out on ^{1100 ft.} the road to Furnace Creek. About ten miles north of Bennett Wells the road deviates eastward and crosses the salt marsh, then turns northward again and follows the east side of the valley to Furnace Creek ranch. Mr. Fumston, who had gone to this place to ~~Furnace~~ a few days before with another party of the expedition, had been collecting specimens about the ranch and in Furnace Cr. canon.

In the afternoon I drove with Mr. Dayton, the superintendent of the ranch to the now unused plant of the Coleman Borax Works (about two miles north of the ranch. ~~There is a grassy marsh similar to that of the Eagle Borax Works, and from its soil most of the raw borate was extracted at the works was obtained.~~

At Furnace Creek ranch was plenty
of alfalfa and excellent water.

Jan. 27. I went from the ranch
across the mesa and up Fox

race Creek ~~the~~ Canyon as far as the
these are slightly alkaline and have a temperature
of 92.5° f. From this point down

to the mouth of the canon, and on to the ranch is a ditch of water ~~empty~~ more than sufficient to irrigate the ~~thirty~~ ^{of alfalfa} ~~thirty~~ acres. The ~~water~~ canon is ~~the~~

is described by a smooth function,

Wetland Plan
#

17 1979 *Crassula* *crenularia*

Jan. 25. I rode back from Furnace Creek to
in the forenoon, and remained at camp the rest
of the day.
Jan. 26. We took an early breakfast
in moonlight, ~~and after bathing~~ preparing to get out
~~for~~ for Sequoia Springs at the south end
of Death Valley. Having now to
leave the freight wagon, we packed
our outfit on ~~the backs~~ ^{two burros} ~~and~~ ^{one} a mule,
an operation which was at that
time ~~to the~~ ^{very} a trying and unsatisfactory, but
which afterward became a constant
~~and~~ ^{necessity} and an easy task. The party
consisted of Mr. Bailey, Mr. Nelson,
Mr. Rikeman and myself with
a packer.

We retraced our route as far
as Salt Wells, near the point where
we entered the valley, and then
turning to the left from the
bumpy road continued in ^{the} ~~bed~~ ^{way} of the
Amargosa. Many years before the

had been a road here, but it was now so ^{nearly} obliterated or obstructed by washes that we found it easier to follow the dry ^{and} often rough bed of the stream. At night we made a dry camp about four miles southeast of Salt Wells. We had packed a small barrel of water for the horses, ~~but~~ ^{but} they drank it very sparingly as it was tainted by ~~#~~ some remnants of soured wine in the cask. We fed them a little grain, but could not supply them with hay. ~~#~~ In their craving for food they ate the herbage of ~~#~~ [#] grindwood and even the ~~#~~ [#] *Atriplex canescens*, *A. polycarpa*, and *suada suffruticosa*.

dry dead twigs of these plants and cactus-back.

Jan. 30. We proceeded up the valley of the Amargosa, and shortly after

following on old road, 46
and midday lunch, crossed some
low foot-hills of the Funeral Mountains,
~~hanging~~ ^{following} a small dry lake situated among
them, and at about dark reached
Dintoga Springs. Here we found
~~was~~ a large warm spring, with
a temperature of 82°F , and very bi-
agreeably alkaline to the taste. The
water from it forms a swamp
several acres in extent with a
~~few~~ ^{other} large areas of open
water. The swamp grasses and
edges furnished feed for our
horses, and we shot ~~many~~ ^{several}
ducks on the pond. With the
exception of the water, we found
the place quite satisfactory for
camping.

Jan. 30. Most of the day was
spent about the spring and swamp,
and in the afternoon I rode ~~out~~
~~out~~ across the valley bottom at

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a point where the American runs west to Saratoga Springs. In the channel the stream contains ^{here} a little very alkaline water.

~~At night three cow-boys have camped at it
as on their from Yerba to Los Angeles.~~

Feb. 1, 1891, Sunday ~~At night our~~
Late in the afternoon our teamster drove in from Daggett

by ~~the~~ route with a load
of grain and provisions, and
with him came Mr. W. C. Bennett,
a reporter for the San Francisco
 Examiner. Mr. Bennett had two
 horses a wagon and a camping
 outfit.

Feb. 2. I rode with Mr. Bennett
 northwestward about four miles
 along the foot of the mountains
 and then ascended a
 long slope northward ^{for a few miles} into the
 mountains, turning to the west
 we then entered a small side canon
 and, following it to near its
 head, ascended a peak 3300 feet to
 Saratoga Springs. At the top

we were still within the ^{belt of} 43
~~there were~~
~~desolate land~~
~~but~~ and we scarce ever
anywhere seen.

In returning to camp after
dark we lost our way in the
mountains, but our horses with
a free rein, brought us safely
into camp at about 9 o'clock.

Feb. 3. I remained at camp.

Feb. 4. in the afternoon I rode
up the valley of the Amargosa a
few miles to some immense
sand hills about 200 feet in
height. ~~They are composed of~~ ^I ~~was~~ ^{the} sand blown and sifted by
the wind, and quite devoid of
vegetation except near the base.

Feb. 5. In the morning I left Rest-
ing Spring alone on horseback and
rode to Resting Spring. ~~From~~ ^{The road has}
~~up the side of the mountain~~
~~the~~ ~~and passes the~~ ^{the} ~~the~~ mine and
continued along the foot of the moun-
tain for a half mile, and then took

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continued up the slope, passing the
silver mine after a few miles
~~and~~ about three miles

The summit ~~was~~ is about twelve miles
~~at the summit~~ to the sixteen
from Saratoga Springs. From that
point the road descends to the
old Amargosa borax works ~~twenty~~
ten miles farther. ~~too~~ ~~miles~~ ~~from~~ a white man
and his family were living
here, looking after the property of
the establishment. From this
point I proceeded eastward about
six miles across the valley
and the bed of the Amargosa
to Resting Springs ranch where I
found our driver with his load
of provisions. Mr. Palmer and
~~his party had not arrived~~
~~from Furnace Creek as I had~~
~~expected.~~

camped the night before at Amagosa
in heavy weather. We then went
into camp by the spring on the
deserted Mitchell ranch about
a mile south of Resting Springs
ranch.

In the afternoon I collected plants
about our camping place and
two or three miles eastward in
a wadsworth toward the Resting Spring
~~a Mr. Black, who lived on a ranch near the spring,
and was holding for the property of the company
name. The broad bottom of
Resting Springs where it opens into Amagosa Valley,
has~~
valley, is made up of
a deposit of clay strongly charged
with alkaline matter. This deposit
has been cut ~~down~~ up in most
parts by little gullies contain-
ing ~~grasses~~ and
themselves in most cases bear
no vegetation whatever.

Feb. 7. In the morning I made a
trip on foot southeast from camp
then around to the south and

had to stop for the water, with
the tortoise ~~water~~ ^{water} being the ~~water~~
ever described above and including
one strip of moist soil.

In the afternoon Mr. Wiley arrived
~~with~~ ^{the} form from Durango Springs
arrived. ~~Feb. 8~~ ^{Feb. 8} I measured it up.
A hard wind blew all day making
it exceedingly cold. The temperature
at one o'clock in the afternoon
at ~~11~~ ^{only} was ~~78° F.~~ ^{78° F.}

Feb. 9. The night was unusually
cold, the barometer registering 10°
at a quarter past six in the
morning. I rode ~~on horseback~~ to
the Raging Springs mine and ~~hast~~ ^{hast}
up a road in the canon ~~the~~ south of
~~from~~ it to the summit of the
~~base~~ ^{base} in the Raging Springs Moun-
tains; and then continued up to
the ~~summit~~ ^{top} of the black butte
south of the pass, ~~the~~ a point
800 feet higher than our camp.
I returned to camp by nearly

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the same route.

In the afternoon I rode down the moist grassy wash in which our camp lay and through the edge of the broad meadows southward of Resting Springs. ~~at the cobra and the basin in which this portion of the valley of the Guadalupe~~ ~~Guadalupe~~ ~~Resting Springs~~ ~~was~~ were some deserted houses that marked the location of ~~an~~ apparently prosperous ranch. This is undoubtedly the spot on the old ~~aboriginal~~ Spanish trail, which Fremont referred to by its current name, ~~the~~ ^{by its current name,} "the archilete". ~~from this point~~ ^{from this point} irrigation ditches

^{# See Frem. Rep. Explor. 1842-4, No. 1, first page.}

are still visible, and the area of natural pastureage is probably ~~over~~ ^{over or five} ~~two~~ ^{two} hundred acres. A screw-bean tree near one of the old house-walls measured, at about a meter from the base 1. m 5 ft ⁱⁿ circumference.

~~The south end of the Guadalupe~~
~~is one of the basins through which this part of the Guadalupe flows~~
~~The basin of the Guadalupe at the foot of~~
~~the mountains of the south, on a~~

range connecting the Funeral ⁷⁸
~~range of mountains~~ mountains on the west with the Resting
Spring Mountains on the east. Through this transverse range a
~~canon~~ ^{cut} now exists by which the
~~canon has been cut~~
valley is drained and through
which the Amargosa River
flows. I rode a short distance
into the mouth of the canon
and then climbed its ~~east~~ ^{west} wall.
~~slope~~ At this point there ~~are~~ ^{are}
~~also are formed by~~ ^{two or} a deposit
of gravel, ~~three or four~~ hundred
feet in thickness. I rode back
to camp over the mesa east of
the valley bottom.

Feb. 10. A party composed of Mr. Al-
mer, Mr. Nelson, ^{Mr. Frazee,} Mr. Burnett and myself,
~~with wife and dog~~ set out for Pan
ump ranch. We followed the road
northward up the gradual slope
of Resting Spring's Valley and at

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night camped at Twelve Mile Spring.

Feb. 11. The party continued northward up the sloping valley bottom and after a few miles travel we came to the summit of the divide between ~~this valley~~ ^{Restings Spring} and Pahrump Valley. I had meanwhile ridden westward from our camping place into the center of the valley. The soil was of clay and bore no creosote-bush, but was characterized by ^{knads} ~~spots~~ of grass-wood, ~~and~~ about the margin of the clay deposit ~~some mesquites appeared~~ mesquite occurred, and the gravel slopes of the valley ^{sustained an abundant growth of} ~~the~~ creosote-bush. —

A few miles north of the summit of the divide the road turns eastward ~~and crosses the divide~~ ~~across the divide~~ and crossing the Nevada line, enters the low level bottom of Pahrump Valley. ^{Late in the} ~~At nearly~~ afternoon we reached

Parmup ranch on the eastern side
of the valley bottom, and at the west
~~the foot of the Charleston Mountains~~

Feb. 12. Early in the morning we
set out for Clarke's saw-mill, in
the yellow pine timber of the western
slope of the Charleston Mountains
and north of Charleston Peak. At
the ~~height~~ ^{altitude} of only 1500 ft above
the ranch, which is about 2000
ft above sea-level, we began to
~~see the tall yuccas~~ ^{we began to}
~~the smaller trees began to appear.~~ The

Yucca baccata and *Y. brevifolia*
last that we had seen being on
the slate range, west of Lone Willow
Spring. At 5200 ft above sea-level
the first junipers ^{#2} appeared and at
Juniperus californica *utahensis*

about ⁵⁵⁰⁰ ~~5400~~ ft became abundant.
At 6:00 ~~the~~ ^{#3} *Pinus monophylla* began, at 7500 the
yellow pine ^{#4} accompanied a few hundred
Pinus monophylla ^{#5} *Pinus ponderosa* ^{#6} *Pinus*

feet higher by the white fir.

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~~#~~ Abies concolor

Owing to the depth of the snow
we were unable to reach the saw-
mill but camped about a mile
below it at an altitude of ~~about~~
8350 ft. For water, we melted snow,
and with the abundance of firewood
in the forest we kept pretty warm.
The temperature at half past nine
in the evening was 14° F.

Feb. 13. After breakfast we took
our horses through the snow
up to the mill and watered
them. Mr. Palmer and I then
continued on foot up the
slope north of the saw-mill
to the summit of a ridge at an
altitude of 9600 feet and then still
northward to another ridge of 10000
feet altitude. At this highest point
the characteristic tree is
~~#~~ the bristle-cone pine, which is ac-
~~#~~ Pinus monilifera

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accompanied by ~~the~~ ^{the white} fire. We re-
Pine ~~be~~ ^{be} ~~be~~

turned to camp, ~~for~~ descending some-
what farther westward, ~~out~~ ^{of} the same
slope by which we came up.

Feb. 17. The entire party returned
to ~~the~~ ^{the} Pahrump ranch where we re-
mained for two days.

~~Feb. 18. I remained at camp.~~
Feb. 19. It was raining much
all day, and we did not start
for ~~Reeding~~ ^{Reeding} Springs ~~as~~ ^{as} we ex-
pected.

Feb. 17. We returned to Reeding
Springs by the same ~~route~~ ^{road} on which
we ^{had} ~~had~~ gone to Pahrump ^{During our}
Frank Stephens ~~before~~ ^{had} ~~had~~ joined the party at Reeding Springs.
had joined the party at Reeding Springs.

Feb. 18. Rained all day, and
I remained in camp.

Feb. 19. The expedition had received
no mail for about four weeks
past, and Mr. Tunison and I vol-
unteered to make the trip to
Pahrump for it. As some topo-
graphical work still remained

to be done in the General Moun-
tains, a party was made up of
Mr. Sibley, Mrs. Zimmerman, Mr. Frazee
and myself with a packer, and
we set out ^{about} an hour be-
fore noon ~~for~~ for a trail in those
~~hills west of Amargosa~~
~~but may~~

We crossed the valley of the Amargosa and went southward a few miles on the road toward Beartoga Springs. Then turning westward we passed up a shallow ~~creek~~^{arroyo} in the mesa, and soon emerging from the traversed the mesa itself, going a little north of west, until we reached the mouth of a canyon ~~in~~^{the} mountains, Amargosa. ~~the~~^{the} ~~way~~^{way} ~~was~~^{was} ~~down~~^{down}. We traversed this canyon for several miles, climbing ^{up} and ~~up~~^{up} dry falls, reaching to the summit of the

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mountains and camped at a small
but excellent spring known as ~~the~~ ^{the} Amargosa
Spring, in a short side cañon
about 2000 feet higher than ~~the~~ ^{the}
Amargosa.

I proceeded on foot up the
cañon to the summit of the
divide, about 250 higher than camp,
~~and~~ ^{from} ~~from~~ that point could be
seen the Panamint range stretch-
ing up above the western ridge
of the Funeral Mountains. In the
~~morning~~ to camp ~~again~~.

Feb. 20. Mr. Tunstall and I went
from camp to the summit of
the peak south of the divide above
us, a point ^{900 feet higher than our} camp. On the north slope of this peak
is a small area which is
just above the upper limit of the
creosote bush, but no yuccas
^{the peak that I camped Feb. 2 left south 25° west}
~~from this point~~ ~~of all others.~~ In the afternoon we
collected down the cañon, about

2 miles below camp.

55

Feb. 21. Mr. Brewster and I, taking our mukluk and a small amount of provision, set out on horseback westward over the divide and down over a broad sloping wash, which we emerged into ~~the~~ Death Valley in the Amargosa about eight miles south-east of Salt Wells. We continued northward and followed the wagon road, a trail passing Salt Wells, ~~and~~ Mesquit Well, and then turned westward across the mesa toward the mouth of Johnson Canon in the Panamint Mountains. After leaving Mesquit Well there was no trail and the mesa was very rough, ^{steep-banked} with boulders and ~~dry~~ washes often 70 feet in depth. In one of these we ~~crossed~~ it dark.

Rain had begun to fall ~~soon~~ after we left Salt Wells, and later nightfall ~~and~~ a steady drizzle set in.

Feb. 22, ~~Friday~~. We ^{continued} in

a bad rain to the the mouth of Johnson Canyon, and rode or walked several miles up it to ^{a place} ~~the~~ which we came afterward to know as Pete's garden, a ~~bit~~ ^{rich} bit of ^{rich} ground cultivated ~~in~~ ⁱⁿ summer by a Panamint Indian named Pete, but ~~now~~ ^{at this season} deserted. We found here a few square rods of growing alfalfa when we staked our horses; ~~and~~ ^{at about this time} ~~in the afternoon~~ ~~then~~ we proceeded on foot toward the pass. Pete's garden lies at the altitude of about ~~feet~~ feet, at the lower edge of timber. From this point upward snow, instead of rain, had fallen, and as we were nearly wet through ~~with~~ ^{the rain on the ground} with ~~the~~ ^{the} all along mountain-side below, ~~the~~ ^{the} cold blasts that ~~were~~ ~~on~~ ~~I~~ ~~lacking sufficient~~ ~~lack of sufficient~~ ~~long~~ rushed down the cañon made the ascent a difficult one. After a climb of about a mile and a

half we lost the trail in the ^{ice-up} snow, and ~~on~~ because of the clouds that hung about ^{the} ~~us~~ mountain we could not tell up which branch of the canon the trail might be. Exhausted and chilled we returned to the ~~ice-up~~ or brush house at Pete's garden, and there passed a miserable night. Torrents of rain ~~fell~~ ^{fell} ~~down~~ ^{flashing}, penetrating the ~~thick~~ structure in which we were, and ~~were~~ soaking our ^{bed} blankets, while outside the wind went down the canon all night in howling whiste.

Feb. 23. Our food supplies were almost exhausted, and the canon was filled with a rushing stream of water that would prevent our ~~riding~~ ^{riding} down it, while higher up ~~the~~ ^{the} mountains were ^{hidden} ~~obscure~~ in clouds. At about one o'clock

in the afternoon however we attempted
a second time to make the pass.
We lost the trail as before and
climbed up the steep mountain
~~slopeside~~ as best we could. The
snow became three feet and
more in depth but at the
higher elevations we were as-
sisted by a crust suffi-
ciently thick to hold us up
~~so~~ if we crawled. The slope
~~was at~~ had an angle of ~~about~~ thirty to
thirty-five degrees and exhausted
as we were from exposure
and lack of food it was only
with the greatest difficulty that
we reached the summit. We
had been unable to make out the
lowest gap in the crest of the mountain,
~~pass among the cedars~~
and had crossed the summit
about a half-mile north of the
pass at the foot of a ~~small~~ ab-

The altitude of this point is nearly 9000 feet.
soft rocky base.] We descended the ⁵⁵⁹
~~west~~ slope of the mountain about
two ~~miles~~ and a half miles to
nearly deserted ~~Alpinia~~ ^{Alpinia} the town of Pana-

mint. ~~all day~~ Three gentlemen,
Messrs Decker, Fairman, and Wall,
who were looking after mining
property ~~at~~ in the vicinity, gave
us a most cordial welcome,
and made our stay at Panamint, after
~~with the comforts of civilization~~ ^{the} ~~with the comforts of civilization~~
the rough ^{trip over the} mountain top, very
pleasant.

Feb. 25. Packing our accumu-
lated mail in two ^{bags} ~~stacks~~, and
tying our feet in gunny-sacking,
we made the return trip to
Peter garden, Mr Decker kindly
accompanying us to the sum-
mit of the pass. Taking our

horses from the alfalfa patch
 we rode down the cañon and
 at about eight o'clock reached
 Bennett Wells ^{in going down} ~~at~~ the moon
 Feb. 26. ~~We~~ ^{He} rode from Bennett
~~town~~ ^{of} side we could see some of the
 effects of the storm. The washes
 in the sloping mesas had
 been ~~water~~ ^{water} ~~towns~~ ^{road} ~~changed to~~ ^{precipitous}
 streams; while the salt marsh of
 Death Valley was more than one-half
 covered with water. ~~The~~ ^{or effect of water} ~~today was~~
~~the~~ ^{the} ~~wash-outs~~ along the ~~road~~
 road in the southern part of the valley
 showed greater denudation from this
 one storm than from the combined
 effect of all the rains ^{the year} since 1886, when
 the road ceased to be used for freighting.

Feb. 26. We went from Bennett
 Wells to Furnace Creek ~~and~~.

Feb. 27. Starting late in the fore-
 noon, we rode southeast up the cañon
 of Furnace Creek about nine miles.

and camped in a cleft in the rocks, on the north side of the canon, at a point known ~~either~~ as Mountain Spring ~~and~~ ^{and} Twelve Mile Spring, ^{names used also for other points visited by the} ~~Spring~~ ^{Both of these names} ~~affid after~~ ^{Expedition} ~~to other~~ ~~places~~ ~~and~~ ~~to~~ ~~other~~ ~~springs~~

Between the Furnace Creek springs and our camping place there ~~was~~ ^{was} no water except one very alkaline spring about one mile below the latter point.

Feb. 28. We left Mountain Spring ^{and about one mile above our} ~~and about one mile above our~~ ~~camping place~~ ~~morning~~ early in the morning ^{and about one mile above our} northward out of Furnace Creek, ^{canon} ~~canon~~ into a branch canon which soon bent around eastward toward the divide between Death Valley and Amargosa Valley. This we followed, and passing over the summit descended on the east slope, ^{late in the} ~~and~~ ~~crossed~~ afternoon reaching ~~reached~~ Ash Meadows ranch. One party of the Expedition had already ~~arrived~~ ~~reached~~ there.

Mar. 1, 1891, ~~to-day~~ I remained in camp. ~~to-day~~

Mar. 2. I made a short trip on foot ~~southward~~ from the ranch and through the neighboring hills. In the afternoon Mr. Bennett and I rode eastward from camp about two miles to a ~~spring in the~~ place called the Devil's Hole, a deep cleft in the ^{foot-hill} rocks, ~~at the foot of some low mountains, filled~~ at the bottom of which a ^{large} ~~small~~ warm spring arose but had no surface drainage.

Southward from the Devil's Hole about a half-mile we came upon a moist calcareous and alkaline swamp in the dry gravelly mesa. From this point we returned to the ranch.

Mar. 3. I rode westward across the valley, passing over the same ground by which Mr. Funston and

I had entered Ash Meadows, namely the alkaline natural pasture of the ranch, the mesquit-covered sand-hills, the Ash Meadows Creek, Amargosa River, and the "self-rising" ground adjoining them. The latter name is applied to loose alkaline soil which is water-soaked ~~at~~ ^{at rainy} periods, ~~at~~ ^{and at such} ~~but which~~ apparently times ~~apparently~~ an effervescence takes place throughout the mass. During the remainder of the season the moisture is dried out, and the soil is powdery and fluffy so that a horse sinks ~~in~~ ⁱⁿ it as in a bog. It is almost entirely devoid of vegetation.

I returned to camp by the same route.

Mar. 4. A party consisting of Mr. Bailey, Mr. Nelson, and myself

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started with a ~~team~~ buckboard, and
one saddle-horse on a trip
farther eastward into Nevada.
On this day we took the di-
rect road from Ash Meadows to
Pahrump passing over the
divide between the two valleys
at an altitude of about 800 feet
above Ash Meadows ranch.

Mar. 5. We left ~~Ash~~ ^{Pahrump} ~~Meade~~
ranch taking the direct road toward the
Vegas ~~#~~ as the principal ranch in ~~the~~ Vegas
Valley is called. We travelled ~~all~~
~~Southward~~
~~across the mesa of death~~

southward ~~#~~ past Gount's ranch,
~~and~~ Nine Mile Spring ~~followed~~ twelve mile spring; then
~~and then the road by a wide~~
~~detour followed the road~~ about to the eastward
up the ~~sloping~~ mesa of
the western slope of the Charlesons,
and at night ~~made a dry camp~~
~~camped for~~ in the ~~succes~~ about 400 feet

higher than Pahrump.

Mar. 6. We continued up the slope, ~~toward the~~ mountain proper, and at an altitude of 5000 feet came upon the first ~~juniper~~ ^{After ~~about~~} ~~rise~~ a further rise of 200 feet we found the ~~Nevada~~ nut pine ~~zone~~. Early in the afternoon we camped at Mountain Spring in the pass just north of Devil Peak, at an altitude of about 5900 ~~feet~~, among the nut pines. ~~the~~ A notable feature of the vegetation of this pass is the abundance of ~~Agave~~ utahensis ^{being} ~~and~~ ^{scattered} ~~scattered~~ ^{more} ~~more~~ utahensis

the pits in which it had been cooked by the Indians ~~are~~ ^{being} frequently found in the vicinity.

Mar. 7. The ~~night~~ was ~~very~~ ^{very} cold and at fifteen minutes before six in the morning the mercury stood at 12° F. ~~We broke camp~~

We went on over the divide, which is very little higher than the spring, and descended the east ~~side~~ of the mountains. No conifers except the juniper and ~~pine~~ ^{not pine} were seen on the slopes north and south of the pass. Early in the afternoon we reached Cottonwood ~~Spring~~, a deserted piece of property now deserted but ^{with an excellent spring of water} ~~still provided with a good spring~~

Mar. 8, ~~Sunday~~. We remained at Cottonwood ~~Spring~~.

Mar. 9. We ~~set~~ ^{left} out eastward and soon came through some low hills into the broad Vegas Valley. Still travelling eastward toward the center of the valley, ~~and~~ ^{and} a little after noon we reached the first springs of Vegas ranch and camped there. In the evening I rode down to the ranch, about three miles distant, and returned again to camp.

Mar. 10. We moved ~~the~~ camp in the

morning down to Vegas ranch, and Mr. Nelson and I set out on horseback, with our beds and provision southward down the valley ~~to~~ about eight miles on the road ~~to~~ to El Dorado, and then turned eastward down the Vegas Wash. For the first eight miles the wash ~~is~~ contains some water, and at the end of that portion is rendered impassable by bogs. We ascended the cliffs on the south bank of the cañon and after riding over them for about a mile descended to the cañon's bottom. Within a few miles the water disappeared, and the remainder of the trip was on a hard dry stream bed. We went into camp on the high sandy bank of the Colorado River, just north of the mouth of the Vegas Wash, at a point ~~just~~ below the Grand Canyon above Black Cañon.

Mar. 11. I spent the day collecting plants about the camp and up the wash about a mile. The sandy bank of the river is overgrown with grape wood and the adjacent gravelly hill *Atriplex lentiformis*

slopes have their customary covering of creosote-bush. The altitude of the place is only about ~~feet~~ feet.

Mar. 12. We started ~~late~~ in the morning from the our camp on the Colorado, and retraced our route of ~~Mar. 10~~ the second day previous about 12 miles. ~~for most of the~~ At ~~part~~ ^{of} ~~of~~ this distance I was obliged to walk as one of our horses had broken his hobbles and left us on the ^{preceding} evening. ~~But~~ we found him feeding at the logs in the wash when we came up. We camped at night on the meadow near the head of the wash a few miles ~~west~~ of the Colorado road.

Mar. 3. We started early in
the morning and reached Segar
mouth at about ~~10~~¹¹ o'clock in the
morning, where Mr. Sibley had been collect-
ing, & where ~~he~~^{it} was staying over night.

May 14. We all set out ~~out~~
northward ~~out~~ up Tige Valley and
after travelling all day on the
road toward Townes, ~~under~~
we went into camp ~~at night~~
at Corn Creek, a roadside stream
near a small patch of ground
had been once cultivated.

Mar. 15. ~~found~~ The trail
came late in the forenoon, and
proceeded northward, and at
first before dark reached ~~the~~
lower ranch.

~~the valley~~ lies east of the Snake-
on Mountains and extends from
near Townes southward about
fifty miles to the head of the
Lower Snake River.

~~once drained~~ ⁷⁸
~~from~~ ~~the~~ ~~it~~ ~~into~~ the Colorado.
On the east it is bordered by
gradually rising low mountain ranges,
some of which toward the northern
end of the ^{nut pine} valley are high enough
to bear ~~aspen~~ ^{nut pine} and to be snow-
covered in winter.

Mar. 16. We left Townes' road
early and followed the road
northeastward and afterward westward
up the slope of the valley ~~toward~~
and over the divide between
Texas Valley and ~~the valley of the~~ ^{the valley of the} ~~Rocky~~ ^{Rocky}
foot. The mesas and the foot-
hills of the mountains in the
vicinity of Townes are compar-
atively well supplied with grass
particularly a kind called
Alvaria Jamesii

The range is so stony, however, and
the ^{charge} ~~absence~~ of water so few and
widely scattered that the cattle
wear their hoof to the skin

in getting to food and water. 71

The divide on which we passed
was so low as to be covered
only by yuccas. We continued
westward and then southward
~~crossing~~ through mountains and
hills and at last ~~but~~ at about nine
o'clock, ^{Watkins' ranch at} we reached Ash Meadows,
by way of having
travelled, by the odometer, forty-nine
miles.

Mar. 19 to 20. I remained in camp
visiting various points in the vicinity
at Ash Meadows. Our freight
wagon had been delayed, and
only through the kindness of
Mr. Watkins were we able to make
out an adequate course of camp
fare.

Mr. Gunton had left Ash Meadows
a few days before to go to
Panamint, by way of Furnace Creek,
for the mail.

On the 18th ~~Mar. 18~~ Mr. Palmer returned

from Daggett ~~today~~ with a load of provisions.

~~Mar. 20. I remained at camp the day.~~

~~Mar. 20. In the morning Mr. Bennett and I went to the ~~Ward~~ Hole.~~

Mar. 21. We broke camp at Ash Meadows and took the road to Furnace Creek, retracing the route over which Mr. Funston and I had come on the twenty-eighth of February, making a dry camp at night a few miles ~~south~~ east of the divide in the Funeral Mountains.

Mar. 22, ~~Sunday~~. We reached Furnace Creek ranch at about sunset, and found Mr. Funston there with the mail. He had attempted first to reach Panamint by crossing the Panamint Mountains at a point northwest from Furnace Creek, but having become lost

among the foothills, ~~and having been~~⁷³
~~there~~ ~~for~~ ~~two~~ ~~days~~ and being in
a serious plight for want of
food and water, he had returned
to Furnace Creek. He started again
by way of Bennett Wells and
Panamint Pass and, the snow
having largely disappeared, made
the trip without ~~danger~~ ~~difficulty~~
~~danger~~ ~~difficulty~~ ~~in~~ ~~camp~~.

~~Mar.~~ 23. We remained ~~at~~ ^{at} Furnace Creek ~~and~~ ^{and} ~~is~~ ^{is} packing up
Furnace Creek ~~much~~.

Mar. 24. We left Furnace
Creek ~~much~~, ~~and~~ took the borax
road south to Bennett Wells.
The Death Valley ^{spring} vegetation was at this
~~time~~ ~~season~~ coming into its fullest
display. Most of the mesquites
were leafed out, creosote bush
was in ~~tall~~ flower, and beside
most of the annual plants and
many of the shrubs. In some
parts the mesas, at a little dis-
tance, appeared yellow from

an extent of many acres from the 74
~~many~~ flowering of one of the desert sun flow-
ers

~~#~~
~~*~~ *Encelia eriophala*

Mar. 25. We left Bennet Wells
and proceeding southward about two
miles on the broad road and then
turning westward we went over the sloping
mesa to the mouth of Johnson Cañon.

Here the wagon was let down the
south bank of the ^{deep} ~~cotton~~ wash, and
we continued up the cañon four or five
miles until darkness came on and
the horses ~~were~~ ^{in addition} were exhausted
~~long full, over boulders and rough~~
from their ~~boulders~~ filled cañon bottom.

Up hill over boulder-covered ground. About
a mile above we came upon the
first spring at a point known
as the lower Indian garden, but
not at that time occupied. Here we
camped.

Mar. 26. We went on up the
cañon past the Indian gardens, where

Panamint 95
two families of Indians were living,
and camped at the beginning of the
junipers about a hundred yards
above the spring that waters Petes
garden.

Mr. Tunston and I went on foot
over the ~~less~~ pass to Panamint and
returned before night with the mail.

Mar. 27.²⁸ Mr. Tunston and I collected
plants for a portion of the day in
the vicinity of the ~~Indian~~ camp, and attended to
the ~~specimens already~~ accumulated in the
passes.

Mar. 28

Mar. 29, Sunday. Mr. Tunston and
I walked to Panamint for the mail, ^{which} ~~arrives~~
arrives but once a week, on Sundays,
and is brought from ~~by~~ Darwin, the nearest station,
on horseback. I turned to
camp in the afternoon.

Mar. 30. I spent the day collecting

in the vicinity of Pete's garden both in the bottom of the canon and on its north bank to the height of about three hundred feet above the wicky-ups.

Mar 31. Mr. Finsler and I collected down the canon for the distance of about a mile from camp.

Apr ~~1~~¹⁸⁹¹, Mr. Nelson, Dr. Fisher, Mr. Bennett, and I with two pack burros and a horse went up the canon to a spring about a half-mile above camp, and from that point ascended the mountain slope to the north, past a deserted wicky-up, and up to the summit of a hog-back in the ~~nut~~^{nut} pines, at the east foot of a small black butte lying about a mile by ~~an air~~^{an air} line, northeast from Panamint Pass. Here, where the snow on north slopes lay still unmelted, at an altitude of about 2200 feet above Pete's garden, we arranged our camp for the night.

Apr. 2. We climbed up the rocky mostly snow-covered ridge toward the crest of the Panamints, passing through a belt of mountain mahogany and ~~California~~ ^{Western} ~~Mountain~~ juniper,
#*Juniperus occidentalis* ~~macropoda~~.

and meeting on north slopes with two pines.^{#2} ~~We reached the mountain crest at an altitude of about 10,000 feet.~~

#² *Pinus flexilis* and *P. aristata*

tude of about feet. This we followed northward ^{or few miles} over rocks and deep but frozen snow-drifts to the summit of a peak having an altitude of about feet.

From this point we could see Telescope Peak ~~about three miles~~ farther northward. It was so late ~~at night~~ in the afternoon and we were so fatigued with climbing at these altitudes that we could not reach Telescope Peak and return to our blankets and ^{the} ~~snow~~ ^{was} quite covered food before night. ~~The~~ The surface of the ground ~~had~~ was ~~the~~

~~tiny snow~~ with snow, except ⁷⁸
except ~~over~~ small areas, where ~~it~~ it ~~was~~
it had been partially blown and
and partially melted away. We re-
turned by the same route to our
sleeping place of the night pre-
vious, and by starlight con-
tinued down the mountain
side to the camp in Johnson
Canyon.

Mr. Funston had collected during
the day down the canon to a
distance of about two miles below
camp.

April 3rd ⁴⁴ ~~remained in~~
~~camp~~ Mr. Funston ^{and I} collected in
the canon above ^{and below} camp.

April 4. ~~Mr. Funston and I~~
~~went collecting down the canon~~
~~nearly to the lower Indian~~
~~garden.~~

April 5, ~~Sunday~~ Mr. Funston
and I went to Panamint, and

remained over night.

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April 6. We returned to camp in the morning, and I walked down the mountain ~~down~~ with the mail, to Bennett Wells, ~~at the bottom of South Valley~~, where I found Mr. Bailey camped alone. I did not reach there until an hour or more after ~~Bennett Wells~~

dark. A high wind from the south was blowing and after I reached the borax road I half tramped was ~~helped~~ along in clouds of dust and whirling sand.

April 7. I rode to Furnace Creek finding there ~~Mr. Dayton, Mr. Bas-~~ ~~Mr. Dayton~~ ~~Mr. Dayton~~ - Mr. Dikeman and his packer, and Mr. Bennett. In the afternoon I went up Furnace Creek Canon a mile or more collecting plants.

Apr. 8. ~~Th~~ In the morning I went again up Furnace Creek Canon nearly to the springs, and returned at about noon. Mr. Stevens

had come in from Mesquite Valley, the northern arm of Death Valley, after a rough trip from Ash Meadows by way of Grapvine Mountain.

In the afternoon I returned to Bennett Wells, where I found Dr. Merriam and his outfit. He had just reached Death Valley from Biggett. Mr. Koebell and Mr. Dickey accompanied him.

April 9. Mr. Dikeman and I went up to the camp in Johnson Canyon from which I had come on the sixth of April.

~~During my absence Mr. Tunison~~
~~had remained in camp~~
had been collecting plants in the vicinity of the camp.

April 10. I ^{worked upon the plants collected in} the ~~past few days~~ in camp, while Mr. Tunison collected in the canyon near camp.

April 11. We ^{broke camp at} ~~all left the~~ Johnson canon, ^{of the mountains} and packed over the summit to the town of Panamint,

and camping at Brewery Spring in Surprise Canon about two miles below, ~~the~~ Apr. 12, Sunday. In the morning I remained in camp, and in the afternoon went to Panamint for the mail.

We collected in the ~~Surprise~~ Canon, as far down as the ~~old toll house~~, collecting ~~down the canon a mile or more, while I remained near~~ the camp, and nearly as far up as Panamint. ~~Apr. 14. We collected down the canon as far as the old toll house.~~

~~Apr. 15. We collected up the canon nearly as far as Panamint, among the lowest junipers.~~

Apr. 16. Mr. Timson and I left the Brewery Spring camp with our outfit and went down the canon ~~to~~ ^{Her we found} Hot Springs, ~~an~~ ~~small party of the expedition~~ ~~had~~ ~~been~~ ~~shing~~ ~~the bottom of Panamint~~ ~~dry-camped.~~ ~~valley at the west base of the~~ ~~Sierra Koebele and Mr. Koch already encamped.~~

Apr. 17. I collected about camp and on the mesa at the mouth of Halls Cañon about a mile north from our camp. Three families of Panamint Indians lived near the mouth of this cañon and cultivated ~~the~~ a few acres of soil, irrigating it from ~~the~~ a small stream of water that flows from the cañon.

Apr. 18. Mr. Koebele, Mr. Finster, and I went collecting ~~up~~ to the mouth of Halls Cañon and a few hundred yards into it.

Apr. 19, Sunday. I ~~went to~~ remained Panamint for the mail, returning in the afternoon to the Brewery Spring.

Apr. 20. I returned to the Hot Springs camp, and found that Dr. Merriam, Mr. Bailey, and McSteveens had already reached there. I remained in camp, arranging our outfit and preparing plants for ship.

[ment.]

(table?)

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Apr. 21. Mr. Tunston and I went collecting up Surprise Cañon to the first spring, about 1200 feet above the cañon's mouth.

Apr. ~~22~~²³, I remained in camp ~~making preparations for~~
~~Apr. 23.~~ ~~remained in camp~~ awaiting the completion of directions for future work.

Apr. 24. The camp at Hot Springs was broken up, one party setting out to for Lone Willow spring en route to southern Utah, another to Sheepheads Cañon on their way to Owens Valley. I took the ~~southward five or six miles~~^{then} road ~~across~~ Panamint Valley and over the Slate Range into Seales Valley where I spent the night at ~~the~~ ~~Seales~~ ~~house~~ of bony works.

Apr. 25. I left Seales in the morning, on the road to Mohave, and passed the night at the summit station of the ~~Seales~~ bony company.

Apr. 26. I ~~set out~~ ^{set out} early in the morning and reached Mohave, on the Southern Pacific Railroad, at sunset.

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after a ride of fifty ~~three~~ ^{one} miles.

~~About fifteen miles~~

From this time I was absent from official duty until the evening of May 9th,¹⁸⁹¹ at which time I took the stage from Mohave en route to Keeler in Inyo County ~~California~~ ~~etc.~~

~~Sunday~~
May 10, 1891. The stage reached Red Rock Station at about two o'clock in the morning and here we changed horses and took a cup of coffee. At about nine o'clock we reached Indian Wells, ~~station~~ where we took breakfast and changed both horses and driver. At about six o'clock in the evening we came to Horse Meadows, and made the third change of horses. A good supper was served to us there. We did not reach Keeler until an hour and a half after midnight, the stage ride covering twenty-nine and a

half hours. ~~ride~~

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May 11. ~~1915~~ Sergeant W. C. Wilkinson, U. S. Signal Officer at Keeler, with the greatest cordiality, placed at my disposal the office facilities of the Signal Station. For this and for ~~much~~ ^{many} other ~~good~~ ¹⁰ assistance in hearty cooperation with the Survey in its work, ~~the Survey~~ the greatest obligations to Sergeant Wilkinson.

~~May 12th 1915~~ I remained at Keeler.

~~May 13.~~ I remained at Keeler.

~~May 14.~~ I stayed at Keeler, making collections ~~on~~ ^{about} the mesa west of Keeler at the west foot of the Cerro Gordo Mountain, and

~~May 15.~~ I collected along the shore of Owens Lake ~~about~~ a mile northwestward from ^{the} town, and ~~on~~ ^{to the east} ~~between~~ ^{through} the and in the adjacent ^{mesa.} ~~and~~ ^{about} ~~the~~ sand-hills ~~and~~ ^{near} ~~the~~ ^{the} ~~way~~.

May 16. I drove to Swansea, ^{about} at the three miles north of Keeler, at the

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foot of the Guyo ~~range~~ range, and from that point along the base of the mountain ~~to~~ nearly to the marble quarry about two miles above, returning to Keeler along the lake shore. ~~I collected plants at~~
Plants were collected at various points along the route.

May 17 ~~Sunday~~. Mr. Farnston came in from ~~for provisions~~ Willow Creek, in the Panamint Mountains, ~~for~~ ~~from~~ ~~where~~ Mr. Nelson and he ~~with~~ ~~is~~ were encamped.

May 18. ~~I left Keeler~~ Mr. Farnston and I left Keeler for ~~Willow Creek~~ ~~Canyon~~, following the trail over the southern end of the Guyo range south of Colorado Mountain. After descending the eastern slope of the mountain the trail continues eastward through the yuccas ~~across~~ ^{about} ~~across~~ northern end of the Darwin mesa, and ~~crosses~~ traversed the summit of the divide between Saline and

This we have designated Mill Gauze divide.

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As we were in the afternoon we
Panamint Valley ~~sign~~ ^{sign} reached camp,
situated at the lower ~~edge~~ ^{edge} of the ~~young~~ ^{old} pines
& about a half-mile west of Jackass
Spring ^{and near} ~~at~~ the head of Willow Creek
Canyon. ~~late in the afternoon~~

May. 19. In the morning we
went collecting
on the south slope of the ~~butte~~
~~butte~~ just north from camp. In the
afternoon we ascended the slope
south of our camp to the sum-
mit of the ridge ~~it~~ overlooking
Panamint Valley.

May 20. I rode to Mill
Canyon Divide and southward ^{two} ~~with~~
~~Darwin~~ ^{road} a or three miles farther to
and Darwin on an old mining
road. I followed a branch of this
~~around~~ ^{about} to the east and down a
side
canyon to the mill in Mill Canyon,
and about a mile farther down.
In returning I ascended the main
canyon directly to the divide.

May 21. Mr. Nealon and I

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with Si took a two days' outfit
and going to Mill Canon divide, de-
scended the canon ^{northwestward into} ~~leading~~
Saline Valley. A few miles below
its head this canon joins that
of Willow Creek. We went into
camp on the mesa where the
canon opens into Saline Valley.
I collected late in the after-
noon about a mile up the
creek.

May 22. I returned alone from Sa-
line ^{Valley} to our Willow Creek camp.
and on the following day tramped to Keeler
~~tramped to~~ ~~and remained~~ ~~the~~ by the
retracing the route of May 18.

May 24, ~~Sunday~~ ^{to 26}, I remained at
Keeler.

~~May 25. I remained at Keeler.~~

~~May 26. I remained at Keeler.~~

May 27. I went ^{collecting} ~~#~~ into the
foothills of the Inyo Mountains
~~up a small~~ ~~small~~ canon northeast
from Swansea.

May 28 to June 10. I remained at
Keeler, collecting and ^{in that vicinity} determining plants, and writing
notes. ~~On the thirteenth~~ On May 30 Mr.
Palmer, Dr. Fisher, and Mr. Koch came in from
Coso and on June 4 they went on to Lone
Pine. On June 7 I rode ^{to the camp at} Lone Pine and
returned ~~to~~ to Keeler.

June 11. I drove from Keeler to Crystal
Spring, in the ^{two} mountains, follow-
ing the Darwin stage road ~~as far~~
about twelve miles as far as the
upper stone coral and turning south-
ward by an old washed road toward
Coso. I camped in the dug-out
by ~~the~~ ^{the} springs, below the beginning of the juniper
in the morning on ^{June 12.} Collections were made on
the slopes about the springs, and
in the afternoon in the cañon
about ^{one half} ~~1~~ mile to the south.

June 13. From Crystal Spring I
drove down the wash that leads from
it, through a narrow cañon, and
into the road that leads from Coso

to Darwin. I continued down this to Darwin and afterward by the stage road to ~~Keeler~~.

June 14, ~~1877~~. I rode to Lone Pine to receive directions from Dr. Merriam, who had just come in from his Utah trip; ~~and stanned~~ ^{I returned} in the evening to ~~the~~.

June 15. Mr. Nelson ^{and} Mr. Finston came in from their trip to the Grapevine mountains returning by way of Mesquit valley, Cottonwood Canyon, and Jackass Spring.

June 16. Mr. Nelson and Mr. Finston went on to Lone Pine, and I busied myself preparing for the journey to Fort Tejon.

June 17. The packing ^{and shipping} of the plant collections was finished, and in the evening I joined the general camp at Lone Pine.

June 18. The day was spent making ~~final~~ arrangements for ^{our coming} journey.

June 19. Our party, composed of Dr. Merriam, Mr. Palmer and myself, started

for Fort Tejon. We took the road 91
down the west shore of Owens Lake, and
camped at night at Walker's ranch, about
a mile north of Olancha post-office.
The route lay in the upper part of the
lower Sonoran but ~~had~~ ^{the first} ~~soil~~
Larva occurred ~~until~~ ^{near the mouth of Cat-}
~~tonwood~~ ^{canon} ~~catch~~. From that point south-
ward it was frequent about the mouths
of canons.

June 20. We left Walker's ranch
and continued on the road south, pas-
sing Olancha, Hayne meadows, Rose Spring
(more generally known as the goat ranch),
and Little Owens Lake; and made a
dry camp about six miles
south of the latter place. From Rose
Spring southward Larva is abund-
ant and with Fraseria dumosa is
characteristic of the region. In the
line of greatest depression in the
valley it is wanting.

June 21, Sunday. We proceeded

southward along the stage route, and ascended the slope of ^{and past Indian Hill,} Walker Pass. ^{We crossed} till opposite the divide of the Sierras ^{up to this} we ascended, and ^{is} been at the altitude of feet, and descended on the west slope a few miles to the first ranch on Canebrake Creek. The summit of the pass is at the uppermost limit of yuccas, on ^{as south} ~~the east~~ ^{On the} slope; ^{and at the} ~~at the~~ ^{as we} summit of the pass ~~crossed~~ the same ^{summit} we came abruptly upon two ~~was~~ and on its western side ^{covered with its yellow flowers} Fremont's ^{my-leaf} and the [#] ~~dogger~~ pine [#] Pinus sabiniana

met our eyes for the first time.

June 22. ^{Leaving} ~~We left~~ Canebrake ranch ~~in~~ we followed the road down to the south fork of Kern river, and continued ^{the} along this ~~to its junction~~ ^{We left} ~~the~~ ^{it} with the north fork and then turned northward ^{kept on to a} ~~continued~~ ranch about a mile south

of Kernville, where we camped.

A phenomenon quite unexpected was presented during the early part of the day's journey. Several ^{the} ~~characteristically~~ ^{desert} species were found to occur on the west slope of Walker pass, ^{some of them} to as low an altitude as feet. Among these plants are ~~the~~ the following:

Asternisia tridentata

Lycium cooperi

Atriplex canescens

Opuntia basilaris

Ambrosia incana

Prunus andersonii

Encelia frutescens

Prunus fasciculata

Ephedra nevadensis

Aplopappus interior

Hymenoclea salola

Tetradymia spinosa

Lycium andersonii

Yucca brevifolia

Five species ~~of desert plants~~ ^{of desert plants} ~~are known~~ ^{are known} not to occur on the west ^{side} of the pass,

Larrea tridentata, Fanerisca dumosa,

Atriplex confertifolia, ^{and} A. polycarpa; but these species belong to the lower Sonoran, a zone having no equivalent in the region of the growth of the

south fork of Kern River. It may be considered therefore that the ~~whole~~ desert flora, so far as the altitude of the region permits, has overrun Walker's pass and extends down ~~as far as~~ the junction of Canebrake Creek with the south fork of Kern River.

June 23. We left Kernville soon after noon ~~taking the Caliente road, which leaves the valley of Kern River a few miles below the fork. As we began the ascent of the~~ ^{river} at the foot of the first divide south of this point, the change from desert to ~~interior~~ montane flora was ~~soon~~ ^{principal} complete. The characteristic trees and shrubs are as follows

Pinus sabiniana

Ceanothus cuneatus

Juniperus californica

Ceanothus divaricatus

Quercus wislizenii

Yucca whipplei

Quercus douglasii

Cercocarpus parvifolius

Frémontia californica

Mimulus glutinosus

We camped at the town of Havilah,
June 24.

June 24. We continued on the ^{Caliente} road, crossing a divide into Walker's basin, and then a second divide into ^{the valley} ~~Caliente~~ of Caliente Creek which we followed down ^{and down} to the town of Caliente. From that point we went about four miles on the Tehachapi road and camped at a roadside ranch.

June 25. We continued ^{on the} fast road ~~over~~ the divide into Tehachapi Valley, through the ~~town~~ village of Tehachapi, and on to the ranch ~~near~~ ^{at} Cameron station at the extreme east ~~at~~ ^{at} Cameron station end of the valley.

June 26. From our camp near Cameron station we went down through Tehachapi ^{Canyon} pass and over the ~~the~~ desert to the town of Mohave.

The change from intra-montane to desert flora begins ^{in the canyon at} Cameron station, and within two miles all the species are those of the desert. Where the canyon opens out into the desert ~~at~~ a few miles east of Cameron

there is no suggestion of an intra-montane flora.)

After a few hours' stay at Mohave, we took the road southward toward Antelope Valley and camped at a place called Willow Spring.

June 21. We turned westward along the northern side of Antelope Valley, following an old road which ~~had~~ soon disappeared. We proceeded across the open mesa several miles and then crossed to the south side of the valley where we came upon a good road. Along this we traveled westward past ^{the house on} Liebre ranch and camped about a half-mile east of Crane Lake.

Larrea ceases about five miles west of Willow Spring, while ^{the} Yucca _{in the middle of the valley} continues, to ^{the} ~~at~~ a point within about three miles of Liebre ranch house. The vegetation that replaces ~~the desert shrubbery~~ ^{these desert species} is made up al-

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most entirely of grasses and other herbs. On the mountains that form the southern boundary of the valley, Pinus sabiniana and Quercus douglasii extend to a point about three miles west of Liebre ranch house.

July 28. We left camp in the morning and proceeded westward past Gorman's Station, over the divide, ^{north of} passing Frazier's Mountain and south of Castac Lake down the Cañada de las Uvas to Fort Tejon. There ~~we~~ under the giant white oak on the old parade ground we camped.

Quercus lobata. See page

June 29, 30. I remained in camp.

July 1. I made an excursion to ^(Kos-tak) Castac Lake, walking completely around it. The water ~~was~~ ^{at that season,} but slightly backish, yet it contained ¹ so far as a careful examination showed, only two aquatics.²

Ruppia maritima and Chara altaica

July 2. I collected about the mouth of Johnson creek, on the hill-sides south-west of the fort. The slopes here were covered with ~~the~~ oaks, # horse chestnuts, #² poison ivy, and cercocarpus #⁴ with a few junipers⁵ and the ~~big-cone~~ ^{big-cone} ~~big-cone~~ false spruce.⁶

Quercus chryssolepis, *Q. douglasii*, *Q. wislizenii*.

#² *Aesculus californica*

*⁵ *Juniperus californica*

#³ *Rhus diversiloba*

*⁶ *Pseudotsuga macrocarpa*

#⁴ *Cercocarpus parvifolius*.

July 3^{to} 5. I remained at camp.

July 6. I went collecting up the ravine of Johnson creek in the mountains back (south) of ~~fort~~ the fort. At about 500 feet above camp they ^{Nevada nut pine} ~~pine~~ # became abundant. ^{It grows in this} This region, in which

Pinus monophylla

the Sierras⁺ and the San Bernardino Mountains intermingle with the coast range, ~~is the only point~~ near the Pacific coast. It may be said here

to inhabit the coast ranges, indeed it reaches ⁹⁹ to a point not more than [50] miles in a direct line from the ocean.

July 1. I rode up ^{head of a valley} to the ~~east~~
that enters the Canada de los Uros from the south, about a mile ^{east of} ~~above~~ Fort Tejon. I then ascended the mountain ^{on the west} slopes ~~westward~~ through scrub-oaks

Quercus dumosa

and ~~nut~~ pines to the summit of the peak, passing on the way a north-sloping ~~on~~ ravine that contained the ~~water~~ ^{white fir} ~~of pine~~. From the top

Abies concolor

could be seen Fraser Mountain southeastward, Castac Lake and Antelope Valley to the east, the snow-capped ^{high} ~~high~~ Sierras to the northeast, and the ^{northwestward} ~~steep~~ broad Tulare Plains ending in dusty haze. The summit is here clothed with a chaparral of *Encelia pacifica*, *Quercus chrysolepis*, *Ceanothus*

Fremontodendron

~~too~~ vestitus and Fremontodendron californicum
 a few hundred feet higher on the
 mountains ~~southward~~ south-
 westward the black pine # begins

Pinus ponderosa jeffreyi begins

July 8. I remained in camp.

July 9. Mr. Palmer and I rode
 to ~~Cudby's~~ Frazier Mountain following the
 road toward Gorman Station to a
 point about two miles above Castaic
 Lake, then ^{southwestward to Cudby's} turning off ^{toward}
 ranch. ^{From the latter point we} ~~We then~~ ascended the west
 face of Frazier Mountain by an old
 road. The base of the mountain is
 clothed with ~~up~~ pines and chaparral
 and about half way to the summit
 the ~~up~~ black pine, ~~and the spruce,~~
 begins, continuing in a heavy forest to the summit
 From the ~~highest point,~~ ^{from which the trees had}
 entire mountain system ^{been removed} ~~of the spruce~~

was exposed to view. We descended the steep northwest slope of the mountain and reached camp late in the evening.

July 10. I remained in camp during the forenoon, and in the afternoon drove to Gorman Station for the mail.

July 11. We ^{broke camp at} ~~left~~, Fort Tejon, ~~and~~ Dr. Merriam having left the party on the June 29. We went down Cañada de las Uvas into the Tulare Plains, ^{and} past Rose Station to Tejon Ranch, where we camped. During our stay here we were most hospitably entertained by the director of the ranch Mr. Pogson.

July 12. Mr. Palmer and I rode up Tejon Cañon, ^{which} ~~the~~ furnishes water to Tejon ranch, and ascended one of the higher divides. An old wagon road extends [±] within

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a half-mile of the summit and ends at a deserted shanty.

Near the ~~beginning~~^{mouth} of the canon the commoner trees are ~~oaks~~^{#1} sycamore^{#2} ~~oaks~~^{#3} with a few trees of cedar^{#4} ~~oaks~~^{#5} and poplars, ~~at about 3000~~

Quercus lobata and Q. wislizenii California post

#² Platanus racemosa

#³ Populus monilifera and P. trichocarpa

#⁴ Libocedrus decurrens

feet the ~~foot of~~^{gray-leaf} pine^{#5} begins, inter-

#⁵ Pinus contorta

mixed with a few ~~nut pines~~^{Nevada nut pines}. Above these comes next the yellow pine^{#6}

#⁷ Pinus ponderosa

and the ^{white} fir^{#8}, and above them

#⁸ Abies concolor

at the summit of the divide^{about 3300 feet above sea level} and ~~and~~ ~~such~~ to an altitude of about 300 feet below, the black pine^{#9} and the great ^{white} pine^{#10}

#⁹ Pinus ~~lambertiana~~ jeffreyi

#¹⁰ Pinus lambertiana

The canon is remarkable for the unusually large number of cone-bearing trees that it contains.

July 13. We left Tejon ranch and followed the road directly to Bakersfield where we went into camp about a quarter-mile north of the town.

~~The Tulare plains, ^{between these two points} are bleak and bare~~

July 14. I remained at Bakersfield during the day. Dr. Merriam met us yesterday and with Mr. Palmer, ^{went by rail to} ~~set out for~~ San Francisco.

July 15. With the teamster and outfit I left for Bakersfield for Visalia. We went into the foothills of the Sierras as far as Poso station on the Glendale stage line, and then followed Poso ^{creek} ~~back~~ down to Poso on the Southern Pacific ~~Railway~~ ^{Railroad}.

July 16. We left Poso in the morning and travelled ~~followed~~ the road

northward along the railroad, camping at night at a point about one and one-half miles north of Tipton.

July 17. We reached Visalia ~~before noon~~.

From this point southward

From a point a few miles south of Tulare to ^{the town of} Visalia the soil of the valley becomes moister, and the white oak ^{*} is a characteristic tree.

^{*} Quercus lobata.

We went into camp at a ranch about a mile northeast from the town.

July 18 to 24. I was occupied in collecting plants in the vicinity of our camp and in preparing for the ascent of the Sierras.

Mr. Bailey and Dr. Fisher arrived from Benicia and Mr. Palmer from San Francisco.

July 25. We all left Visalia and travelled to Three Rivers a post-office in the foot-hills of the Sierras in the valley of the Kaweah River.

Aesculus californica

Ceanothus cuneatus

Mimulus glutinosus

Quercus douglasii

" wislizenii

Rhamnus

Rhus diversiloba

Until we reached the foot-hills the vegetation was similar to that about Visalia. Then Douglas' oak began followed by the other ~~Characteristic~~^{#1} ^(see slip) vegetation. ~~foot-hills~~ region Characteristic woody

July 26. In the morning I passed the time collecting near those rivers. At about one o'clock ~~+~~ one party, consisting of Mr. Bailey and myself, started for Mineral King. We camped at Kanes Flat.

July 27. We continued up the ~~mountain-side~~ ~~road~~ as far as Big Tree canon where we camped at about the lower limit of the yellow pine. With these grew the giant sequoia[#], the ~~big~~ ^{great} ~~sugar~~ ^{sugar} ~~sequoia gigantea~~

~~pine, the California false~~ ^{#2} ~~pine, and the~~ ^{post} ~~Juniper,~~ and the ~~cedar,~~

^{#2} Tunion californica

and the red oak^{#3}

^{#3} Quercus Kelloggii

July 28. Mr. Bailey and I went down the road about three-fourths of a mile

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to a ridge upon which stood a deserted house. From this point, which was below the zone of Pinus ponderosa we descended down the dense chaparral to the bottom of the valley reaching the river at the point of its junction with Big Tree Cañon. We returned to camp following part way up the cañon and then climbing the ridge which we had descended. The chaparral here is composed of Ceanothus, Cercocarpus parvifo-
lius, Fraxinodendron Quesius, Fraxinodendron col-
liforme, and Arctostaphylos and a Ceanothus which was not identified.

July 29. I spent the forenoon collecting in the cañon, above camp; and after dinner we continued a few miles up the mountain, camping about a half-mile above saw-mill.

July 30. I collected a few specimens about camp, and in the afternoon we proceeded to Mineral King, an old mining camp now used as a camping ground.

in summer.

for summer pleasure parties. We went into camp on the south side of the stream about a half mil. east of the old hotel ~~collected~~ about camp.

July 3rd Mr. Bailey and I ascended the mountain-side north of Mineral King nearly to timber line. The conifers the trees that we found were ~~Abies magnifica~~ ^{western white fir} ~~Abies~~ ^{#2} ~~coastal~~ ^{California} ~~Juniperus~~ ^{western juniper} ~~Juniperus~~ ^{#3} ~~black pine~~ ^{black pine}, ~~larch~~ ^{#4} ~~larch pine~~ ^{little sugar} ^{#5} ~~sugar pine~~ ^{mountain} ^{#6} ~~sugar pine~~ and ~~one of the~~ ^{and} ~~fox-tail pine~~ ^{#6}.

#1 *Abies magnifica*

#2 *Juniperus occidentalis*

#3 *Pinus ~~farionae~~ jeffreyi*

#4 *Pinus contorta murrayana*

#5 *Pinus monticola*

#6 *Pinus balfouriana*.

~~Left~~ Aug. 1st In the afternoon we rode up to the snow on the west slope of Farewell Gap and returned by the same trail.

Aug. 2nd I spent the day collecting in the vicinity of camp.

Aug. 4, I drove down the road ^{four or} five or six miles ~~collecting plants~~ ^{collecting plants}.

Aug. 5. We moved camp from Mineral King to a ~~forest on the~~ group of red firs beside the trail about half way to Farwell Gap.

Aug. 6. Mr. Bailey ^{and I} followed a trail southward from camp around a spur of the mountain to some ponds in the vicinity of the ^{deserted} White Chief mine. The ^{herbaceous} flora was very rich and new.

Aug. 7 ~~Mr. Bailey~~ ^{We} retraced our steps of the previous day and continued up the mountain-side back (south) of the White Chief mine, past a little lake half filled with ice, to the ~~summit of the~~ crest of the mountains. We descended on the other side of the ~~slope~~ ^{summit} a few hundred feet to another lakelet, and then ~~returned~~ ^{returned} to camp in the same

route. This was the first collecting that I had done above timber line ~~and~~
Aug. 8. I collected plants in the vicinity of camp.

Aug. 9 I remained in camp.

Aug. 10. We moved camp ~~from~~ ^{to Lyon} Meadows passing over the trail through Farwell Mts. The last few miles of this journey was outside the government reservation, and had been pastured by sheep ~~so closely that all the low~~ vegetation was stripped from the ground. We ~~had been~~ ^{had} ground away ~~the~~ found the same conditions throughout the remainder of our journey in the Sierras. Only in the moister portions of the meadows could the horses get anything to eat.

Aug 11. We continued along the trail to Front Meadows through a forest made up principally of yellow pine.

Aug 12. We struck out northward from Front Meadows following the trail to ~~the Kern Lakes~~ ^{the south side of the} Kern River and the north fork of Kern River and continuing up this stream past the two Kern Lakes to ~~at the~~ Dick's Meadow ^{River} the ~~point~~ ^{place} known in the Wheeler Survey report as Soda Springs. It is now used in summer as a camping ^{resort} for hunting and fishing parties. The river here has an altitude of only feet and flows southward through a valley between the two main ridges of the Sierras.

Aug. 13 I fished for trout all day in the river.

Aug. 14. In the morning Mr. Bailey and I tramped up the river about four miles, crossed it, and came down on the east side. In the afternoon

collected ~~about~~ⁱⁿ the meadow by our camp.

August 15-16 I remained at camp.

August 16. I remained at camp.

August 17. We broke camp at Soda Soda Spring ~~Dicks~~^{Soda} Springs and proceeded over the ~~Hockett~~ trail to Whitney Meadows.

Aug 18. Mr. Bailey and I rode over the divide northeast of Whitney Meadows into Round Valley on the headwaters of the south fork of Kern River, and followed this stream up to Big Cottonwood Meadows, where we found Mr. Dutcher and Mr. Koch camped. We ~~also~~ returned to camp by nearly the same route.

Aug. 19. I collected plants, ^{near camp} in the meadow. Mr. Bailey and Mr. Dutcher came into camp late in the afternoon.

Aug. 20. Mr. Bailey, Mr. Dutcher, and I walked along the western edge of the meadows to their northwestern extremity, and following up a little stream to

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crossed the divide, which is nearly at timber-line, into a ^{another} broad meadow north of Whitney Meadows. Traversing the eastern end of this meadow we ascended the mountain slope to the summit, about 500 feet above timber line. From this point we looked down upon the little lakes that form the source of the south fork of Kern River.

Above timber-line all the vegetation was herbaceous and scanty. We returned to camp by the same route.

Aug. 21. I collected specimens near camp in the meadows

Aug. 22. I rode over to Mr. Dutcher's camp and descended the eastern slope of the Sierras by the Hockett trail to Lone Pine. Mr. Nelson and Mr. Finston had already reached there and were camped ^{at} Harveys ranch.

Mr. Funston and I drove down to Keeler, ~~where~~ packed up the specimens awaiting shipment there, and returned to Lone Pine.

Aug. 24 I returned to the camp in Whitney Meadows.

Aug. 25. Mr. Bailey and I with a packer and one pack animal set out on the mt. Whitney trail, crossing the divide northwest of Whitney Meadows, ~~where~~ we had crossed it Aug. 20, and descending the valley of the first stream westward to a point about eight miles from Whitney Meadows, ~~where~~ ^{went into camp.} ~~we camped~~

Aug. 26. We returned to the camp at Whitney Meadows.

Aug. 27. The day was spent making arrangements for the breaking up of the expedition.

Aug. 28. Mr. Funston and I with our packer and outfit left Whitney Meadows and set out on the

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return to Visalia, by the same route
over which we I had come. We
passed ~~Dicks~~^{Soda Springs} meadow and the larger
of the Kern River Lakes, and camped at the small-
er one.

Aug. 29 We reached Lyon
Meadows and camped there.

Aug. 30. We crossed Forwell Gap,
~~and~~ ~~#~~ passed Mineral King, and
stopped at the ranch, about a
mile below, where I ~~staid~~^{stayed}
over night. Mr. Tunison and
the packer went on and camped
at Atwells saw-mill.

Aug. 31. I descended the moun-
tains as far as Bahwell's ranch,
~~the~~ ~~W. of~~^{the} ~~Sierra~~^{Sierra} ~~mountain~~^{mountain} ~~rushing~~^{crossing} ~~Three~~^{Three} ~~Rivers~~^{Rivers}.

Sept. 1. We reached Visalia,
where ~~I spent the next two days~~
~~the next two days~~^{the next two days}
~~the next two days were spent~~
~~spent~~ ~~disposing~~^{disposing} of the outfit, and
the botanical field work of the expedition was ended.
~~We proceeded to San Francisco, and~~
I proceeded to San Francisco and from
that point to Washington.